

1922  
M 42



# HOW ILLINOIS WILL FEED HER NEW WATERWAY

BY

ALVIN GUGELER MATHEWS

B. S. University of Illinois, 1921

## THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF MASTER OF SCIENCE IN BUSINESS  
ORGANIZATION AND OPERATION IN THE GRADUATE  
SCHOOL OF THE UNIVERSITY OF ILLINOIS,  
1922

URBANA, ILLINOIS



Digitized by the Internet Archive  
in 2015

<https://archive.org/details/howillinoiswillf00math>



1922  
M 42

UNIVERSITY OF ILLINOIS

THE GRADUATE SCHOOL

June 1

1922

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY  
SUPERVISION BY Alvin Gugeler Mathews

ENTITLED How Illinois will Feed Her New Waterway

BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR  
THE DEGREE OF Master of Science

Frederic A. Russell  
In Charge of Thesis

H. T. Scovill

Head of Department

Recommendation concurred in\*

Committee

on

Final Examination\*

\*Required for doctor's degree but not for master's



## TABLE OF CONTENTS

CHAPTER I	THE NATURE OF THE PROBLEM	PAGE 1
CHAPTER II	ILLINOIS WATERWAY HISTORY AND THE PRESENT PROJECT	PAGE 4
CHAPTER III	WATER TRANSPORTATION COSTS	PAGE 16
CHAPTER IV	COMMERCIAL ASPECTS	PAGE 28
CHAPTER V	RELATED PROJECTS AND PENDING ISSUES	PAGE 64
CHAPTER VI	THE RESULTS OF THE SURVEY	PAGE 80
BIBLIOGRAPHY		PAGE 83



## LIST OF PLATES

Plate		Page
I	The Route of the Illinois Waterway	9
II	The Project from Lockport to Utica Showing Alignment and Profile	13
III	Territory Given low Transportation Costs by the Mississippi-Warrior Service	18
IV	Coal in Illinois	31
V	Premier Coal Producers	39
VI	Coal and Grain Production within the Forty-Mile Area Contiguous to the Illinois Waterway	56
VII	The Hard Roads Plan for Illinois	57
VIII	Railroads Connecting with the Waterway	58
IX	Area and Destination of Grain Export Trade	60
X	States Demanding an Outlet by Means of the Great Lakes Seaway	65
XI	Cities to Become Seaports	66
XII	The Illinois Waterway as a Link in the Water Transportation System of the World	67
XIII	Route of the Proposed International Waterway from Lake Ontario to the Head of Ocean Navigation	70
XIV	The Flood Prism on the Illinois River Before and After the Construction of Levees	78



## CHAPTER I.

## THE NATURE OF THE PROBLEM

Not a little significance was attached to the arrival in Chicago, October 20, 1914, of four barges loaded with lumber that was brought from Louisiana by water. The lumber was carried as far as La Salle, Illinois, on a single steel barge, the "Jack Cook," reaching that city by way of the Mississippi River and the Hennepin Canal. At La Salle the barge struck shallow water and it was necessary to transfer the lumber to four smaller barges of such light draft that they could navigate the old Illinois and Michigan Canal and pass through the small locks of that antiquated waterway.

This shipment of lumber was made by a Chicago firm with large mills in the south, for the purpose of demonstrating the possibilities of water transportation. It was not considered feasible at that time to continue the shipments on the basis of transferring freight to small barges at La Salle, but the general opinion prevailed that it was only necessary so to improve the channel and enlarge the locks as to permit the bringing of freight from the south direct to Chicago without breaking bulk, to make possible the shipping north by water of much southern lumber.<sup>1</sup>

For many years past there has existed in the state of Illinois an emphatic demand for a waterway between Chicago and the Gulf of Mexico. The practicability of such a waterway was noted by Pere Marquette when he first discovered the portage between the Chicago River and the Des Plaines River centuries ago. Its feasibility

-----  
<sup>1</sup>Daily News, Chicago, October 21, 1914.





ity was further noted by the early pioneers of the state and the boundary lines of Illinois were fixed, upon its admission to the union of states, so as to provide for this waterway.<sup>1</sup>

As is inevitable in a discussion of a topic of such importance as this one, there is bound to be a difference of opinion, and many people believe that the development of waterways solely in the interest of the general public, would not hurt the railroads. Many who believe that such a policy would injure the railroads, nevertheless, have the public spirit to advocate that which they believe to be for the general good. There is a large group, on the other hand, which is of the opinion that development of waterways is uneconomic. Whatever is for the public good ought to be done even if in consequence some particular interest suffers.

In the following discussion of the problem, the question that had to be considered first of all in regard to the Illinois Waterway, was whether the carrying out of the project would secure cheaper and more adequate facilities for transportation. Following a chapter given over to the history of canal development in Illinois and a description of the proposed new Illinois Waterway, the possibilities for reduced freights on this avenue of transportation are determined by an historical and contemporary investigation.

In dealing with canal or waterway rates it is essential to keep in mind, the entire economic cost of transportation, including not only the rates that the shipper pays to the owners of the boats, but also what the public pays in taxes for improvements and construction of the waterways.<sup>2</sup>

<sup>1</sup>-----  
Message to the Illinois State Legislature, Edward F. Dunne, Governor,  
February 17, 1915.

<sup>2</sup>Data which are reliable are a bit scarce in this country, for this



With the probable freight cost established, the next step involves a comprehensive survey of the potential freight supply, in order to throw light upon the question of just how the Illinois Waterway will be furnished with tonnage. A necessary intervening chapter dealing with some closely associated phases of the subject comes next and this is followed with some conclusions concerning the economic good to be performed by the Illinois Waterway.

-----  
expense. In Europe it is decidedly different. There the Governments endeavor to keep accurate information on such matters.



## CHAPTER II.

## ILLINOIS WATERWAY HISTORY AND THE PRESENT PROJECT

After the completion of the Erie Canal in 1825, a frenzy of canal building swept the country. Although the total cost of this canal to the State of New York was over seven million dollars, before it was completed the tolls had aggregated over a million dollars and by the close of the season of 1832 sufficient tolls had been collected to pay the entire cost of the canal. For many years the canal tolls were ample to pay all the expenses of the state government.<sup>1</sup>

Canal building operations extended as far west as Illinois and Wisconsin where the Illinois and Michigan Canal was completed in 1848 and the Fox River Canal in 1856.<sup>2</sup> Ohio had its canal system completed at a much earlier date.

The beginning of railway building in the United States was contemporary with the canals of the early part of the nineteenth century. The Canals had blazed the way through the wilderness, established industries and developed the natural resources of the country. The railroads paralleled the canals and waterways, and became keen competitors for the trade already built up.<sup>3</sup>

<sup>1</sup>-----  
Fairlie, John A., The New York Canals, Quarterly Journal of Economics, XIV, p. 212.

<sup>2</sup>Putnam, James W., The Illinois and Michigan Canal, p. 23.

<sup>3</sup>It should be borne in mind that railroad building in Dakota and Minnesota began on a large scale only after the enlargement of the "Soo" Canal, when it was seen that there would be good connections and facilities for a through direct water route to Buffalo. Professor John A. Fairlie, in an article entitled, The Economic Effects of Ship Canals, in the Annals of the American Academy of Political and Social Science, for January, 1898, (Vol. XI) describes this development at length.





Until during the eighties the canals were able to meet this competition and in fact, the most important of them did a flourishing business until about the beginning of the present century. The patenting of the process of making Bessemer Steel by Sir Henry Bessemer in 1858 was responsible more than any other one factor for the ultimate retrogradation of the internal waterways of early days. This process permitted the production of steel rails in large quantities on account of the cheapness of manufacture made possible by it. It was inevitable that the needs of the time coupled with the opportunities presented by the new process should bring about a period of frenzied railroad construction more intense than had been the canal mania fifty years before. The craze reached its height in the decade 1880 to 1890.<sup>1</sup> Then as a reaction to this period of over-expansion of transportation facilities came the great rate wars and methods of unfair competition which did not lessen until many of the railroads were in the hands of receivers, some of the canals closed and Federal laws enacted to deal with the evils.

During the eighty-year period since their inception, the railroads had continually improved and developed their roadbeds and facilities for handling freight, while the canals remained in the same primitive state in which they were first built and the freight was handled in the same ancient manner. The trend of the times was toward the railroads, encouraged by the activities, fair and unfair, of those who had their money invested in them.<sup>2</sup>

<sup>1</sup>Johnson and Van Metre, Principles of Railroad Transportation, p. 31.

<sup>2</sup>"The main reason why the commerce on our navigable rivers is so much smaller than on those of Europe is not that our rivers are potentially less efficient facilities of transportation, but that our railways are more efficient than their railways and make lower rates. The governments of continental Europe so regulate the rates of the railways as to make them rather inflexible, while the boats





## The Illinois and Michigan Canal<sup>1</sup>

In 1836 the State of Illinois began the construction of a canal connecting Lake Michigan at Chicago with the navigable portion of the Illinois River at La Salle. This canal was opened to navigation in 1848 and became a very important factor in the settlement of northern and central Illinois. Financially the canal was a success. During the Civil War it was a great factor in meeting transportation needs of that period.

From 1860 to 1890 this canal not only handled a large tonnage but its revenues were more than sufficient to pay its cost of construction and its operating maintenance.<sup>2</sup> From 1880 to 1900 the canal was still handling sufficient traffic to pay its operation and maintenance. The construction of the Chicago Sanitary District and Ship Channel and its opening in 1900, because the bed of the Illinois River and that of the Chicago River was used in part, materially interfered with its operation and the revenues decreased.

In 1870 railroad interests succeeded in having adopted a provision in the State constitution prohibiting the extension of the State's credit to canals or railroads.<sup>3</sup> By this provision the

-----  
are allowed to give all the flexibility to their rates necessary to secure business."--Frederic A. Delano, in an address before the National Rivers and Harbors Congress of the United States, Washington, December 8, 1910.  
Railway rates in the United States are about half those of Europe.

<sup>1</sup>Putnam, James W., The Illinois and Michigan Canal, in which an excellent treatment of the whole subject is found.

<sup>2</sup>Putnam, James W., An Economic History of the Illinois and Michigan Canal, Journal of Political Economy, XVII, May, June, July, 1909.

<sup>3</sup>The clause is as follows: "The Illinois and Michigan Canal shall never be sold or leased until the specific proposition for the sale or lease thereof shall first have been submitted to a vote of the people of the State at a general election, and have been approved by a majority of all the votes polled at such election. The General Assembly shall never loan the credit of the State, or



State was prevented from making any appropriations to take care of its own property, and there was little opportunity for enlargement of canal locks for boats of larger capacity, necessary to compete with rail tonnages. Paralleling railroads took advantage of this situation. During the summer, rates within the territory accessible to the Illinois River and to the Illinois and Michigan Canal were lowered about forty percent.<sup>1</sup> As soon as navigation closed for the season these rates were promptly raised.<sup>2</sup> The loss was made up in every instance by compelling the long-haul shipment outside this territory to pay a higher rate. At the time this insidious system was effective there was no power of rate control over the railroads, either Federal or State.<sup>3</sup> The effect of this unfair practice, together with the handicap upon the future of canalization which the railroads had succeeded in making a part of the constitution, soon put this canal out of business as an active factor in freight transportation.

The construction of the canal cost \$6,170,226. The income

-----  
make appropriations from the treasury thereof in aid of railroads or canals. Provided, that any surplus earnings of any canal may be appropriated for its enlargement or extention."

<sup>1</sup>Putnam, James W., An Economic History of the Illinois and Michigan Canal, Journal of Political Economy, XVII, May, June, July, 1909.

<sup>2</sup>Honorable James Shaw, of Carroll County, speaking before the House or Representatives on May 14, 1879, made the following statement: "The Chicago and Rock Island Railroad makes its freight tariffs higher in the winter than in the summer. Now, where several routes, of the same or different kinds, exist between terminal points, or great centers of trade, that route which is shortest or cheapest must regulate terms for all the rest; and this by a well-known natural law. Does the canal lower freights at any or all seasons on the Rock Island Railroad? If so, then the roads east and west of that line, in competition with it, must also lower freights. And this is exactly what does take place when the canal is open, and to some extent when it is closed by the embargo of winter. Freights are then stored and wait for the opening of the canal in the spring of the year."

<sup>3</sup>Very little Federal regulation existed before 1887.





from tolls and leases up to 1915 was \$6,964,518. The total amount of freight handled from 1880 to 1915 was 74,000,000 tons. Canal Commissioner Brainerd estimated in 1885 that up to that time the canal had saved the people of the State \$180,000,000 in freight charges.<sup>1,2</sup>

### The Illinois Waterway

The Illinois Waterway is the official name given to the waterway to be built pursuant to a referendum vote of the people of Illinois in 1908. That year the people of Illinois voted to bond the commonwealth in the amount of \$20,000,000 for the construction of a deep waterway and powerplants incident to the project from Lockport to a point in the Illinois River near Utica.<sup>3</sup> The Illinois River was to be used without canalization from Utica on south to its mouth at Grafton.<sup>4</sup> Plate I, page 9, shows the route of the Illinois Waterway.

Since the authorization of this bond issue, engineers and others have proposed various plans for carrying out the will of the people. Among these plans at least three have been given serious consideration.

-----  
<sup>1</sup>"For many years all of our domestic waterways have suffered from the same causes. Their narrow channels, shallow depths, inadequate locks and primitive terminal facilities present a striking contrast to the State and nation aided development of the railroads of the country. Our railroad trains carry from 1,500 to 3,000 tons of freight in a single train; our canal boats, 200 tons as a maximum load. Under such circumstances it is not surprising that our canals and waterways have fallen into comparative disuse."-- Special Message of Charles S. Deneen, Governor, to the Forty-seventh General Assembly, April 25, 1911.

<sup>2</sup>Putnam, James W., The Illinois and Michigan Canal, Chapter II.

<sup>3</sup>Barnes, M. G., The Illinois Waterway, p. 1.

<sup>4</sup>It is expected that the Illinois Waterway can be used from nine to ten months out of the year. Although the upper end of the stream is in a latitude which usually has freezing weather about four months in the year, the warm sewage currents and factory wastes from Chicago will tend to modify the effect of the cold.



PLATE I.

## THE ROUTE OF THE ILLINOIS WATERWAY

LEGEND

Canal ———

Canalized River ———

Section of the Illinois River  
to be used without canaliza-  
tion ———





The first plan proposed, contemplated the construction of a ship channel from Chicago to the Gulf, of dimensions adequate to accommodate ocean going vessels. After a good deal of careful consideration of this plan it was rejected because it was not considered feasible to construct waterways through the Illinois and Mississippi Rivers with depths sufficient to accommodate ocean vessels,<sup>1</sup> and even if feasible, the cost would be out of all proportion to the prospective benefits.

The next plan proposed was for a barge canal with locks 55 by 250 feet. A law was enacted in 1915 for the purpose of initiating construction under this plan. The general opinion among engineers was that the second plan with its puny estimate of the actual and future needs of the State, had erred as much on the one side as the proposed ship Channel did on the other. Neither plan received favorable consideration from the War Department and permit for construction was not issued.

This was the condition of affairs when Governor Lowden took office in 1917. He found a mandate from the people by direct vote authorizing the construction of a deep waterway and power incident thereto; a law enacted by the Legislature in 1915 appropriating \$5,000,000 for its construction; and the plans for the waterway contemplated by the act of 1915 disapproved by the War Department.

-----  
<sup>1</sup>"A great many intelligent persons concede that the traffic on the inland waterways of the United States, except the Great Lakes, has declined, while that on the waterways of Europe has increased, because of the cheap and superior service of our railways, and contend that we can make our waterways successful competitors of our railways only by making our waterways greatly superior to the waterways of Europe. They, therefore, advocate digging canals and canalizing our rivers to depths exceeding those attained on such waterways in any other country. One of the plans is for a fourteen foot waterway from Chicago to New Orleans. It is questionable if the results would be worth the cost."--Frederic A. Delano, in an address before the National Rivers and Harbors Congress of the United States, Washington, December 8, 1910.



About this time Mortimer G. Barnes, a graduate of the University of Michigan and one of the nation's outstanding engineers with pronounced achievement in the construction and improvement of waterways, was chosen as Chief Engineer, Department of Public Works and Buildings, Division of Waterways of the State of Illinois.

After reviewing all the data available, Mr. Barnes recommended that both plans theretofore considered be rejected and a third, of which he was the author, adopted. A portion of his recommendation containing a short description of a third plan is here given:

"Experience in transportation on highways, railways and waterways has shown the cost of transportation to vary inversely to the load transported. The construction of waterways the world over has shown that they have been built too small or at least the business attracted to waterways has outgrown their accommodations. Federal engineers have realized this in planning for the improvement of the Ohio River in which stream they have designed locks 100 feet wide and 600 feet usable length.

"With the conditions above numerated prevailing (referring to sections on economic conditions, tonnage and hydrology in the first part of the report), there is but one answer to the problem. To be designed along economic lines, the waterway should be broad and of medium draft to meet the natural conditions of the streams to be utilized, and the locks should be so designed as to accommodate fleets of large tonnage. To meet these conditions, it is recommended that the channel should have a bottom width of at least 200 feet and the locks should have horizontal dimensions of 110 feet by 600 feet, which would make them capable of passage of cargoes of from 7000 to 9000 tons in one lockage. The channel depth should be a least eight





feet and the locks should be so designed that in the future when business has increased and money is available the channel could be deepened to fourteen feet.<sup>1</sup>"

These recommendations met the approval of the waterway interests of the State of Illinois and negotiations were at once entered into with the War Department seeking its approval of the plans for a waterway based on such recommendations. In 1919 a bill was presented to the Legislature, providing for the construction of such a waterway and repealing the act of 1915. Before the bill was enacted it was presented to officers of the War Department who assured the State that the plans would be approved if presented in accordance with the bill as drawn. The bill was enacted late in the legislative session with but two or three dissenting votes and as soon as a preliminary report could be presented to the War Department, the plans were approved. Plate II, page 13, shows the alignment and profile of the canal as now contemplated.

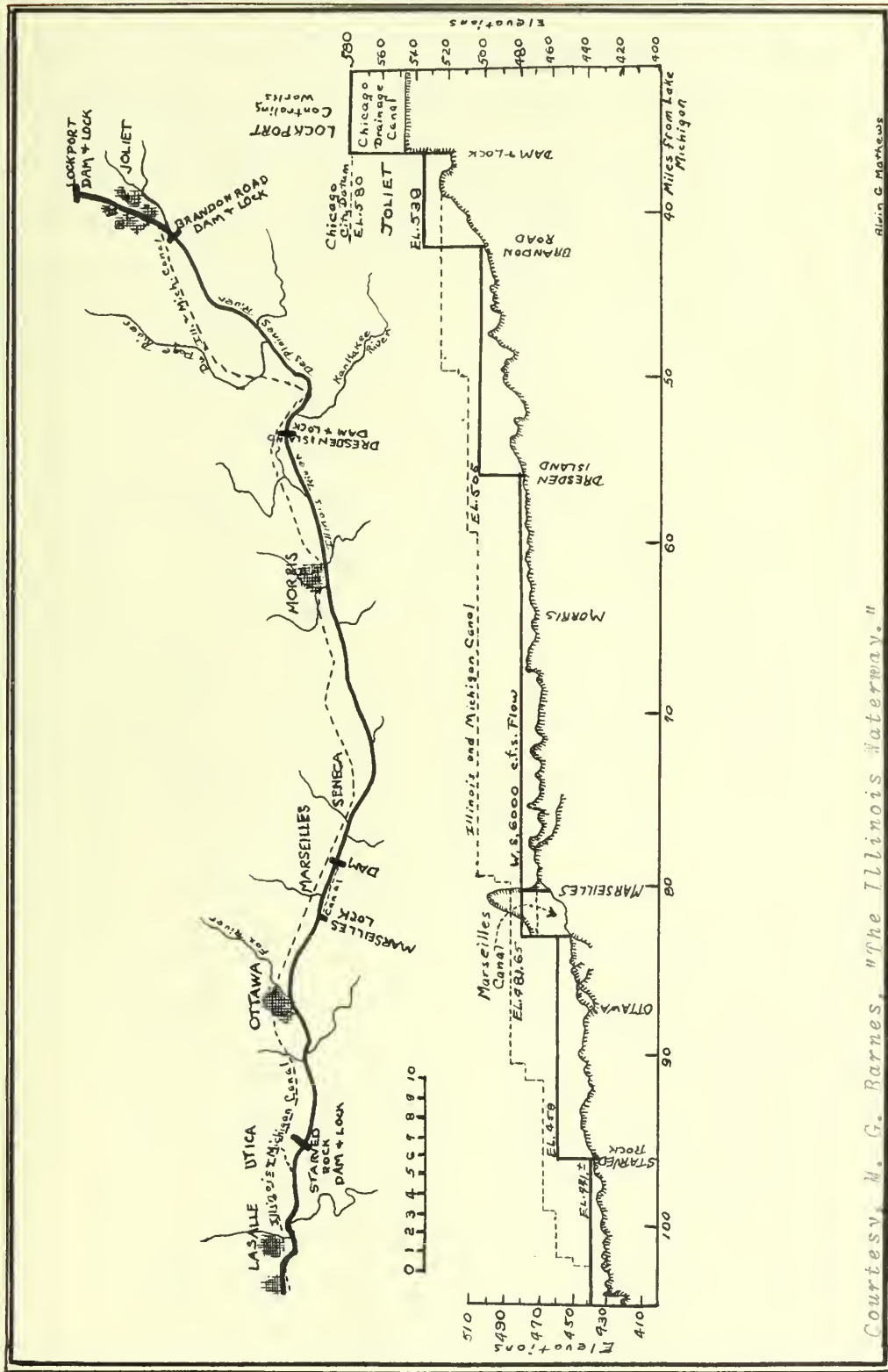
About this time, a bill which Congress, looking to intelligent development and utilization of the water power on the navigable streams of the United States, had been trying to pass for some time, became a law and required that in the improvement of navigable streams consideration should be given to full utilization of the stream for both power and navigation purposes so as to best conserve their natural resources. In early studies for the development of navigation on the Illinois River by the Federal engineers, little attention was given to power possibilities. This was excusable because at that time water power was of little value and the transmission of electrical power for long distances was unknown.

At the time of this writing, Mr. Barnes and his colleagues  
<sup>1</sup>H. J. R. 41, State of Illinois, p. 2.



PLATE II.

THE PROJECT FROM LOCKPORT TO UTICA SHOWING ALIGNMENT AND PROFILE



Courtesy, M. G. Barnes, "The Illinois Waterway."

ALVIN C. MARKWIS





are engaged in completing the details of the project so as to carry out this dual purpose of the canal in the most advantageous manner. The site for the first lock is at Lockport about thirty-five miles southwest of Chicago, where at the terminus of the Chicago Sanitary and Ship Canal there is now a small lock and power-plant. This lock with a lift of forty-one feet will connect the Sanitary District channel with the Des Plaines River. The second lock, to be known as the Brandon Road lock, will be constructed at the southerly limits of the city of Joliet and will have a lift of thrity-one feet. A dam and power-plant to generate 28,000 horse-power will be constructed here. The Kankakee and Des Plaines Rivers meet about twelve miles below the sight of this second lock and form the Illinois River. On two miles from this junction is the site of the third lock at Dresden Island. It will have a lift of seventeen feet and there also will be constructed a dam and power-plant to generate 18,000 horse-power. As a result of the location of this lock, navigation will be extended about five miles up the Kankakee River.

From this point downstream, the Illinois River can be utilized for several miles in its natural condition. At Marseilles near the upper end of Bell's Island is the site of the fourth lock with a lift of twenty-one feet, and a power plant to generate 7,000 horse-power.<sup>1</sup> The plans at present provide for only one more lock. This fifth lock will be at Starved Rock below Ottawa and near Utica, and although it will permanently flood large tracts of land fronting the river and several large tillable islands between Marseilles and

I-----  
 1 At Marseilles there exist numerous water powers and thriving industrial communities have been built up because of them. To save this industry, a canal has been projected around the rapids at Marseilles some 12,000 feet in length, this being the only canal to be constructed as a part of the present development of the Illinois Waterway.



Utica, it is the most economical procedure as the cost of any method of construction to save these lands from inundation would be greater than the value of the lands. This lock will have a lift of sixteen feet with a dam and power-plant to generate 22,000 horse-power. From Utica on, the Illinois River may be used for the kind of navigation contemplated without canalization.

But one contract has been let for work on the Illinois Waterway--that for the lock at Marseilles.<sup>1</sup> This contract was let October 26, 1920, and at the present time about one-half the work has been completed.

-----  
<sup>1</sup>The feeling that the State is delaying unnecessarily in carrying on the construction of the Waterway, is expressed quite clearly by Hugh L. Maxwell in an editorial entitled, Illinois Waterway Delayed Needlessly, appearing in the Illinois Journal of Commerce for May, 1922. A portion of the editorial is quoted:

"Feeling is widespread throughout Illinois and the entire Middle West against the delay in going ahead with the Illinois Waterway, that would make the Illinois River navigable from the Great Lakes to the Mississippi River and the Gulf of Mexico. Business interests are of the opinion that since the bond issue of \$20,000,000 for carrying on the work has been approved, and practically all technicalities connected with the project done away with, nothing should prevent the State Administration from launching further into it. Cities all along the route have signified their desire for the Waterway, permits have been obtained from the Federal Government, and it only remains for the State Administration to advertise bids. Heretofore the State has deferred the greater portion of the work on the Illinois Waterway because of the undeniably high costs of labor and materials. But these reasons for postponement do not hold altogether good today. Reductions have come about both in labor and material, and the present is as auspicious a time as any to push to completion the project that will directly benefit 6,500,000 people in Illinois and thousands of others in the Mississippi Valley."

Speaking of the need of prompt action on the part of Governor Small in completing the work of the Illinois River project, Progress Reports, for April 28, 1922, says: "He is the one man who can give us a navigable route through the valley within three years and he is the only man who can keep us from having it. He has full authority to go ahead and we believe the work should not be delayed longer. Every day's delay is not only costing the business men of the valley dollars and cents, but is costing the farmers extra transportation for their grain."





## CHAPTER III.

## WATER TRANSPORTATION COSTS

The commercial and agricultural life and growth of the State of Illinois depends upon the proper use of highways and their costs as they affect producer and consumer. There are four major water-transportation routes of great interest to Illinois--the Mississippi River, the Great Lakes, the Illinois River (which when improved will become an effective link between these two), and the Ohio River.

The pioneer used all these routes freely. The first great impetus of the State came from their use, and thereby Illinois came to be of such importance in the world of production and distribution that, when the age of railways arrived, these new implements of transportation came promptly to Illinois and gave it a greater railway growth than that enjoyed by other regions. It became the greatest railway state and neglected to keep up the water routes, heedless for the time of fundamental economics; for the cost of conducting transportation by ships and barges is lower than is possible by any other known means.<sup>1</sup>

-----  
<sup>1</sup>The number of miles which one dollar will carry a ton of freight is frequently given for the various transportation agencies, in the following form:

Carrier	Miles per \$1.00
Horse and Wagon	4
Auto Truck	20
Railroad	100
New York Barge Canal	300
European Canals	500
Great Lakes Freighters	1000
Ohio and Mississippi River, Downstream	3000

Cornish, L. D., Assistant Chief Engineer, Division of Waterways,  
 State of Illinois, Transportation Costs, p. 8.



Now that freight charges are such an increasing part of the total cost of bringing producer and consumer together, Illinois is wakening anew to her potential advantages. Excellent judges state the average freight saving per ton on freight which would move by water if the Illinois Waterway was in use, at from one-two dollars per ton.<sup>1</sup> The volume of freight is of course a factor and must be taken at a conservative estimate. Of the many millions of tons now traversing by rail practically the same route, how much will naturally and with economy seek the water route? No one can say with mathematical certainty, but some of our best posted traffic men state figures in millions of tons. Suppose a thousand tons a day is taken as an estimate for the start with an advance within twelve years<sup>2</sup> to figures making an average for the twelve year period of only 1,000,000 tons a year. If the estimate is right the saving on freight is \$1,5000,000 a year.

Farmers today can ship their grain by rail to St. Louis and thence by water down the Mississippi River to seaboard, at a saving of eight cents a bushel below any rail route to any point on the seacoast.<sup>3</sup> The Mississippi-Warrior service has a freight traffic arrangement with the railroads by which every community in Illinois receives benefit, of twenty percent below the rail rate, from this waterway. This is illustrated graphically by Plate III, page 18.

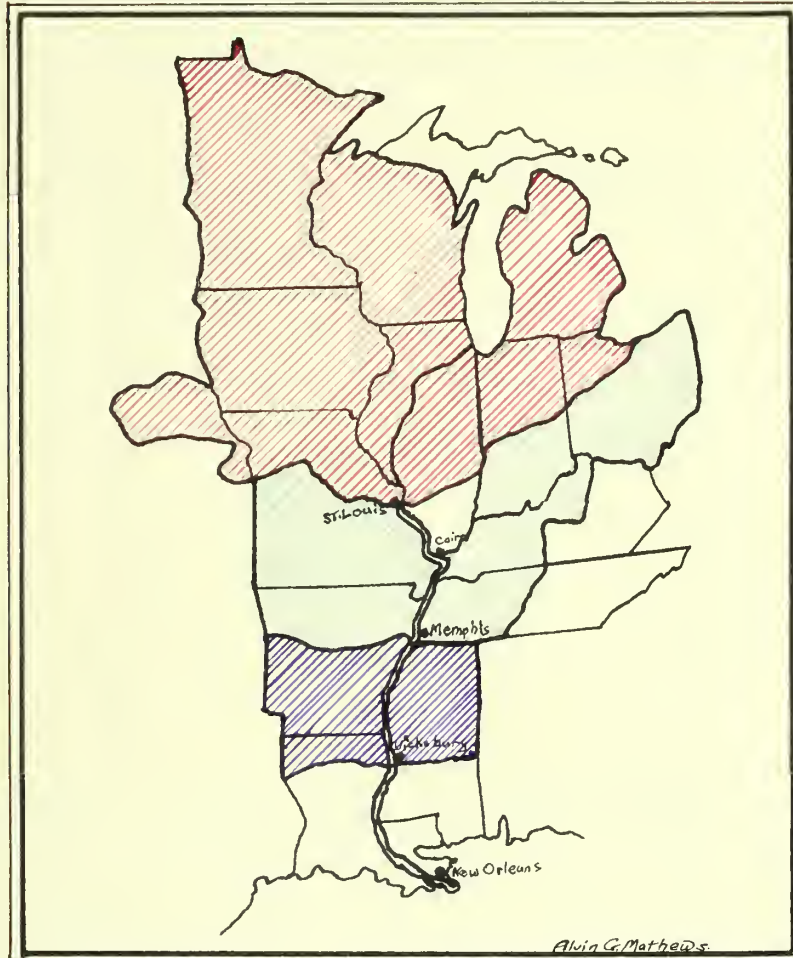
<sup>1</sup>Gardner, H. C., Commercial Need turns to Waterways, Illinois Journal of Commerce, June, 1921.

<sup>2</sup>Twelve years is the period elapsed from the time the Illinois Waterway was authorized until work was actually going on, (1908-1920). The total preventable loss to society according to this estimate, was \$30,000,000 for the period.

<sup>3</sup>Barnes, M. G., Speech at Henry, Illinois, June 17, 1921.





PLATE III.TERRITORY GIVEN LOW TRANSPORTATION COSTS BY THE  
MISSISSIPPI-WARRIOR SERVICE

The average saving on first class freight in the Red Area, is 30¢ per cwt.; in the Green Area it is about 21.5¢; and in the Purple Area the saving is 16.5¢ per cwt.



The transportation carried on by this Mississippi River service is eighty percent Chicago and Illinois business, so that the people of Illinois today are receiving twenty percent differential on that benefit because a boat line comes to St. Louis.<sup>1</sup> It is fair to assume that the saving will be much greater when the waterway is completed to Chicago.

The average freight rate on all railroads in the United States was seven and a half mills per ton-mile for a number of years and a special group of coal roads could be selected upon which the average was about five mills.<sup>2</sup> The increases in freight rates during the past few years have about doubled these figures. For bulk commodities such as grain, coal, sand and gravel on roads which are competitors of the Illinois Waterway and Mississippi River between Chicago, the Illinois Coal Fields, St. Louis and New Orleans, the present rates average about ten mills per ton-mile.<sup>3</sup>

<sup>1</sup>-----  
The Government-fostered river service representing an investment of about \$8,000,000 to date, makes St. Louis virtually a seaport for export shipments by way of New Orleans. Through joint rail and water rates put Mississippi Valley points and the fertile trade territory tributary to the river into direct trade communication with St. Louis industries. The barge rates are a flat twenty percent less than railroad rates, with the same insurance protection, and the delivery by barge can be made as quickly, in most cases, as by rail. This saving is a distinct advantage in close competition. It means a profit on goods which otherwise have to be sold at cost, or at a loss, to hold trade in competition. The Mississippi River, as a freight carrier, has "come back". Before the Civil War, in the hey-day of river commerce, 3,149 wooden-hull stern- and side-wheel packet steamboats of twenty-six tons burden each, plied the stream. Their total carrying capacity is exceeded by the more than forty 2,000-ton modern steel barges of the fleet now being operated between St. Louis and New Orleans with four steel oil-burning tunnel-type towboats of 1,800 rated horsepower each. The barge line is handling a rapidly increasing tonnage of great variety, and is gaining in popularity with shippers of all classes.

<sup>2</sup>Final Report of the Industrial Commission, Vol. XIX, pp. 274-281.

<sup>3</sup>This figure is arrived at by averaging rates taken from the current tariffs.



On the New York Barge Canal the rate on such commodities is about three and a third mills, while on several European canals the rate is from one to two mills.<sup>1</sup> The statistical report of lake commerce passing through the canals at Sault Ste. Marie for a number of years, shows that the average freight charges per ton-mile steadily decreased to a minimum of six-tenths of a mill in 1914. The increased costs of the war and post-war periods caused this rate to increase until it averaged one and a third mills per ton-mile in 1920. The average for the past twenty years has been 0.82 mills.<sup>2</sup> Coal is carried at cost on account of its necessity for ballast, so making allowance for this, a fair average rate for lake traffic is one mill per ton-mile.

What has been done and is being done at the present time by water transportation, is shown by the foregoing paragraphs and the table in the footnote at the bottom of page 16. The people of Illinois however, are primarily interested in what the Illinois Waterway will do toward providing cheaper transportation. To assume that the rates on similar or inferior waterways in the United States at the present time, are a measure of those to be charged on the Illinois Waterway is the safest method of arriving at the probable rates.

The navigable Monongahela River reaches seventy miles above Pittsburgh, is improved for eight feet draft and has twin locks fifty-six feet by 360 feet. The single fleet lock capacity is about 33-1/3 percent of the Illinois Waterway locks, or 3000 tons. In recent years

-----  
<sup>1</sup>Clapp, E. J., The Navigable Rhine, pp. 112-117.

<sup>2</sup>U.S. Statistical Report on the Sault Ste. Marie, 1921.







the traffic on this river has been as follows:<sup>1</sup>

Year	Tons	Value	
1914	10,374,000	\$20,714,000	
1915	11,815,000	28,180,000	
1916	12,876,000	35,673,000	
1917	16,009,000	64,210,000	
1918	16,538,000	64,720,000	80% coal & coke
1919	14,630,000		Coal only
1920	20,718,000		Coal only
1921	15,000,000		Coal only--
			Business
			Depression

The barges are returned empty, the coal traffic being a one way haul. The government figures for the cost of hauling this coal, including six percent interest and ten percent depreciation on equipment, are as follows per ton-mile:<sup>2</sup>

2000 ton fleet	5.50 mills
3000 " "	3.12 "
4000 " "	2.50 "
5000 " "	2.00 "
6000 " "	1.68 "

The decrease in cost as the size of the cargo increases, indicates that for 9000-ton cargoes, the cost would be about one mill per ton-mile.

The above costs are for a waterway on which it is necessary to separate large fleets into 3000-ton units at each lock. Inasmuch as the Illinois Waterway locks can pass 9000-ton fleets in a single lockage, it is evident that the cost of one mill per ton-mile should not be exceeded on such commodities as coal, ore, sand, gravel and grain.

No one will dispute the claim that the cost of water transportation between Chicago and New Orleans or long hauls to intermediate points will not exceed the profitable rates now in effect

<sup>1</sup>-----  
<sup>1</sup>Cornish, L. D., Transportation Costs, p. 9.

<sup>2</sup>Ibid., p. 11.



between St. Louis and New Orleans, on the basis of cost per ton-mile. The small added cost from lockage at the upper end of the haul, will be balanced by the saving effected from distributing the fixed charges over the added number of miles.

The government-operated Mississippi-Warrior service between St. Louis and New Orleans has steadily improved during the last three years<sup>1</sup> and since April 1, 1921, has shown operating results before deductions for depreciation as follows:<sup>2</sup>

April to August, Profit	\$324,681.10
September to November, Deficit	<u>79,324.91</u>
Profit	245,356.19
December, Profit	<u>47,372.29</u>
April to December, 1921, Profit	\$292,728.48 <sup>3</sup>

Allowing for depreciation at ten percent, the net profit to the Government is \$263,455 for the nine month period, or a return of four and a half percent on the investment of \$8,000,000.

The present equipment can handle 1,000,000 tons of freight annually, equal to 40,000 freight car loads,<sup>4</sup> at a saving under rail

<sup>1</sup>In the Manufacturers Record of Baltimore, for February, 1922, Clark McAdams, tells us that almost surreptitiously, during the Great War, when the railroads were groaning under the strain put upon them, the Government spent some \$8,000,000 for equipment in restoring the Mississippi to the status of a great freight-carrying waterway. The barge line on the lower Mississippi, operating thru the first years with inadequate equipment, lost money, but the railroads during the same period lost \$600,000,000. The barge line in its first year, with a small temporary fleet, supplied 75,000,000 ton-miles of transportation service and, this historian assures us, when its fleet is complete it will furnish 1,000,000,000 ton-miles of service annually. Following the war the Government continued to develop its barge line. In the five months, beginning with May, 1921, it earned \$257,000 more than its operating expenses, and is declared to be the only business enterprise in which the Government engaged during the War, that made money.

<sup>2</sup>Cornish, L. D., Transportation Costs, p. 10.

<sup>3</sup>Ibid.

<sup>4</sup>Ibid.



rates of \$1.00 per ton.<sup>1</sup> Tow-boats pulling five barges each, with a capacity of 2,000 tons to a barge, are making the trip from St. Louis to New Orleans in six days and the return in twelve days.<sup>2</sup> It was prematurely estimated that traffic upstream would be only sixty per cent of the down stream traffic. Experience has proven that the traffic is about equal; that the molasses, sugar, oil, and sisal going north has the same tonnage as the grain going south.<sup>3</sup>

The Mississippi-Warrior service is operated under a joint rail and water rate which is eighty percent of the rail rate. These rates are effective over a large territory bordering the river and for the Northern Zone, shipments are by rail to St. Louis or Cairo thence by the barge line to New Orleans or intermediate points. The shipper save twenty percent of the through rail rate, but his saving is entirely at the expense of the barge line. The railroad gets about thirty-one percent of the full through rail rates for its 280 mile haul to St. Louis and the barge line gets what is left. The result of this is that the barge line carries a great deal of freight from St. Louis to New Orleans at figures which are materially less than eighty percent of the rail rate between those points.

The Barge line operating costs per ton for the fiscal year ending June 30, 1921, were as follows:<sup>4</sup>

Terminals	\$1.73
Hauling	1.69
Damages	.18
General	.52
Total	<u>\$4.12</u>

-----  
<sup>1</sup>Wheat in the Mississippi Valley has been worth three cents a bushel more to farmers the past year than it would have been except for this barge line. Current Opinion, April, 1922, p. 544.

<sup>2</sup>Ibid.

<sup>3</sup>Ibid.

<sup>4</sup>These figures and those following, by L. D. Cornish.





Of these, haulage varies almost directly with the mileage and it is reported that for full cargoes this item is less than one and five tenths mills per ton-mile. The average terminal costs and damage claims are very high on account of the crude way of handling freight at some of the terminals. Results obtained at the completed modern terminals give assurance that the terminal costs will be reduced to \$1.00 per ton and damage claims to below the railroad average of two and a half percent of freight receipts, which for the barge line would be about ten cents per ton.<sup>1</sup> The traffic and general expenses during the three months of January, February, and March, 1922, were reduced to thirty-one cents. These items plus \$1.69 for haulage cost aggregate \$3.10 as a liberal estimate of the operating expense per ton for barge transportation costs between St. Louis and New Orleans. The only material operating cost which should be added for through traffic between New Orleans and Chicago is the haulage cost for the additional 400 miles, which at one and half mills per ton-mile amounts to sixty cents per ton. The operating cost between New Orleans and Chicago may therefore be assumed as not exceeding \$3.70.

The possibilities of profit to transportation companies and lower rates to shippers is indicated by the last column in the following tables which show the difference between \$3.70 and the present Mississippi-Warrior Service joint rail and water rates per ton. This difference is wide enough to justify the claim that rates on this waterway can be made as low as fifty percent of present rail rates. It should be kept in mind, however, that any reduction of rates much below the scale now in force for the Mississippi-Warrior Barge Line would probably curtail net profits and decrease the return to the

<sup>1</sup>-----  
This statement is justified by the experience of the St. Louis-Kansas City Barge line whose damage claims were seventy-five percent





Government, which at present is four and a half percent on the investment. The decrease in rates could vary directly with increasing tonnage until capacity was reached, the return on the investment remaining the same.

Future reductions in the cost of labor and materials which may result in and justify lower rail rates will also justify lower water rates. The cost of carrying commodities varies greatly with their character,<sup>1</sup> therefore the figures in the last column indicating the margin over actual cost may be in error for any particular item but the mean figures are essentially correct.

-----

less per \$1.00 of freight charges than those of the competing Missouri Pacific Railway Company.

<sup>1</sup>"The transportation charge on the material entering into a pair of shoes made in a St. Louis factory averages one and one fourth cents. The transportation charge required to place that pair of shoes in the hands of a consumer in any part of the United States averages between two and three cents. The freight rates on cantaloups to New York range from less than a cent a melon from the Carolinas to about two and one half cents for that from California. The freight charge paid on the apparel of a fully dressed man or woman would range from six or seven to sixteen or eighteen cents."--McPherson, L. G., Railroad Freight Rates, pp. 49-52.

"The freight on a dining-room suite selling for \$75, is a little over two dollars."--The Freight Rate Primer, National Prosperity Association, St. Louis.

From the above examples it is easy to see how widely the percentage of freight rate varies to the total value of the shipment. In general, the relation the freight rate bears to the value of the article is a small percentage in the case of high value articles of small bulk, and a large percentage for articles of small value but large bulk.



## FREIGHT RATES PER TON C.I.

Chicago to New Orleans<sup>1</sup>

	Rail Rates		Mississippi Warrior	Miss. War. Less Cost of \$3.70
	1913	1921	1921	
Agricultural Implements	\$ 7.20	\$12.00	\$ 9.90	\$ 6.20
Canned Goods	7.00	11.70	9.70	6.00
Dried Fruit <sup>2</sup>	8.20	21.80	17.90	14.20
Glucose	5.00	8.40	7.10	3.40
Packing House Products	7.80	13.10	10.90	7.20
Paints, Red and White Lead	5.60	9.30	7.80	4.10
Rails	7.60	6.30	5.60	1.90
Salt	4.60	7.70	6.60	2.90
Soap	6.20	10.40	8.70	5.00
Starch	7.00	11.70	9.70	6.00
Steel, structural	5.60	9.30	7.80	4.10
Stoves and Ranges	8.80	14.70	12.20	8.50
Varnishes	8.20	13.70	11.40	7.70
Mean	\$ 7.44	\$11.56	\$ 9.64	\$ 5.94
Corn for Export	\$ 4.00	\$ 7.90	\$ 5.38	\$ 1.68
Wheat for Export	4.00	7.90	5.68	1.98
Mean for Grain	\$ 4.00	\$ 7.90	\$ 5.53	\$ 1.83

New Orleans to Chicago<sup>1</sup>

Canned Goods	\$ 6.40	\$10.70	\$ 8.90	\$ 5.20
Coffee	5.00	12.00	9.70	6.00
Cotton <sup>2</sup>	10.34	21.90	21.10	17.40
Dried Fruit <sup>2</sup>	7.80	21.80	17.90	14.20
Fresh Fish <sup>2</sup>	11.00	18.20	14.90	11.20
Glucose	5.80	9.70	8.10 <sup>3</sup>	4.40
Lumber	5.10	8.40	6.90 <sup>3</sup>	3.20
Petroleum	4.60	7.30	6.10	2.40
Rice	7.00	11.70	9.80	6.10
Sisal (Import)	5.60	10.30	7.10	3.40
Sugar	4.86	12.00	9.60	5.90
Steel, Structural	6.00	10.00	7.00 <sup>3</sup>	3.30
Mean	\$ 6.62	\$12.83	\$10.59	\$ 6.89

-----  
<sup>1</sup>Current Published Joint Tariffs

<sup>2</sup>For such high value articles as these, the figures in the last column are probably considerably too high.

<sup>3</sup>Estimated Rates



The average joint rate from Chicago to New Orelans on wheat and corn for export is \$5.53 per ton. Of this the railroad gets \$2.65 per ton for a 280 mile haul or nine and a half mills per ton-mile and the Barge Line gets \$2.88 per ton for a 1200 mile water haul or two and four tenth mills per ton-mile. The all rail distance from Chicago to New Orleans is 920 miles and the all rail export rate on grain is \$7.90 per ton or eight and six tenth mills per ton-mile.

For commodities other than grain, lumber and Birmingham steel shown in the foregoing table, the average joint rail and water rate is \$10.35 per ton of which the railroad gets \$3.85 per ton or 13.8 mills per ton-mile and the Barge line \$6.50 or five and four tenth mills per ton-mile. These authentic figures show that the government barge line can carry freight at a profit for about one-third the ton-mile rail rates now in effect. When the Illinois Waterway is completed and modern barge lines established between Chicago and New Orleans better results can be obtained.





## CHAPTER IV.

## COMMERCIAL ASPECTS

If commerce were dependent entirely upon water transportation, the commercial strategic value of the Illinois Waterway would be excelled only by the Suez and Panama Canals, and Chicago would be the metropolis of the world.<sup>1</sup> The valley of the Mississippi River and its tributaries is the most productive region in the world for food, forest, mine and manufactured products.<sup>2</sup> With the exception of the Soo Locks and channels connecting Lake Superior and Lake Huron and the canalization of the Monongahela River for seventy miles above Pittsburgh, no other waterway in the United States ever had as bright prospects for developing capacity tonnage as has the Illinois Waterway.<sup>3</sup>

This waterway is comparable with the waist of an hour glass connecting the Great Lakes-St. Lawrence-New York Barge Canal Systems, the North Atlantic Ports and Europe, with the Mississippi River System of 15,000 miles of inland waterway, the Gulf Ports, South America, the Orient and our West Coast States. It will have a capacity of 60,000,000 tons a year.

-----  
<sup>1</sup>Barnes, M. G., The Illinois Waterway, p. 2.

<sup>2</sup>Statistics of the Depart of Commerce show that eighteen tons of products originate each year for each person in the United States. As the Mississippi Valley is the greatest producing area, twenty tons is a low figure for this section. The population of this section is 60,000,000 and on this basis its product is 1,200 million tons. Ibid., p. 13.

<sup>3</sup>The tonnage per year through the Soo locks for a period of 25 years from 1891 to 1916 increased from 9,000,000 to 91,888,219 tons, an average increase of 3,320,000 tons per year. Traffic fell off during the war period but the average for the past five years has



## Geologic Structure Along the Waterway.

The geologic map of Illinois shows the course of the Illinois Waterway to be through a part of the state well endowed by nature with economic products.<sup>1</sup> From Chicago at the northern terminus as far as Millsdale west of Joliet, the course is through a section whose geologic content is dolomite, used for building, furnace flux, concrete and road making. Next comes about six miles of shale for paving brick and sewer pipe; clay for pottery and tile; and stone for building, road making and concrete. From this section to a point about five miles east of Ottawa, the formation is carboniferous of the second Pennsylvanian type, containing workable coal beds; limestone and clay for Portland cement; clay and shale for building and paving brick, sewer pipe, pottery and tile; stone for building; mineral waters; and occasionally salt.

The next geologic section stretches on to La Salle and is the one containing the famous Ottawa sand for glass making, moulding and building. The area of the formation is not unlike a gigantic lizard in shape with the head and tail pointing to the north. The course of the waterway splits the body almost squarely in the middle. From La Salle almost as far as Beardstown, the formation is again carboniferous and is rich in coal,<sup>2</sup> shales, clays, and stone of com-

-----  
been 81,000,000 tons of which 55,000,000 tons was east bound iron ore for Eastern States and the Seaboard and 16,000,000 tons of Eastern coal to supply the Northwest states. The traffic on the Monongahela River has now reached the capacity of the locks and amounted to 24,000,000 tons in 1921 of which 21,000,000 tons was coal.--Barnes, M. G., The Illinois Waterway, p. 12.

<sup>1</sup> Illinois State Geological Survey, Bulletin No. 1, The Geological Map of Illinois.

<sup>2</sup> In the neighborhood of La Salle and Peru as far as Spring Valley, at Sparland, from Peoria to a point fifteen or twenty miles south of Pekin, and again near Rushville, coal mines now being worked, line the banks of the Illinois River.--Peabody Atlas, Illinois Coal Fields.



mercial importance. Plate IV, page 31, shows the section of the state containing coal.

The formation from Beardstown on down to Grafton is carboniferous of the Mississippian type, as is that on the Illinois side of the Mississippi River from Grafton most of the way to Cairo, and contains limestone and oolite for building; stone for lime, concrete, riprap, and road making; and limestone and shale for Portland cement. Near the southern end of the state this formation shows veins of fluorspar, lead, zinc and baryta; mineral waters; and some salt.

In the territory contiguous to the Mississippi and Ohio Rivers near Cairo, another good sized deposit of glass-making sand is found. Silica, green sand for fertilizer, limestone, clay, and gravel for ballast and road making are also there in abundance.

### Cities Along the Waterway.

#### Chicago

The fact that Chicago is the greatest distributing center in the United States, makes the use of the waterway to capacity tonnage an assured fact as long as freight rates are low enough. Chicago now consumes 30,000,000 tons of coal per annum and the consumption is increasing at the rate of 1,000,000 tons annually.<sup>1</sup> About half of this coal comes from Southern Illinois mines within forty miles of navigable water. Coal from these mines can be delivered to Chicago by water for \$1.00 per ton less than present freight rates, consequently a large coal tonnage through the waterway can be depended upon. M. G. Barnes, Chief Engineer of the Division of Waterways of the State of Illinois, states in a report to the General Assembly of the State, that he has been approached by, and has held many conferences with

-----  
<sup>1</sup>U. S. Census, 1920.





## PLATE IV.

## COAL IN ILLINOIS



Shaded area indicates coal deposits of Illinois as shown by State Geological Survey.

Illinois produces 90,000,000 tons of coal a year.

67% of the area of the State is underlaid with coal.

The potential productive supply of Illinois coal mines exceeds that of any other State in the Union.

25% of all household bituminous coal shipped from mines in the United States comes from Illinois.

The coal source is an important consideration in the location of industries.



officials of various corporations seeking information relative to terminal facilities, fleet capacity of the waterway, and date of completion. He asserts that the aggregate tonnage through the waterway for which these corporations are planning totals 15,000,000 tons of coal and 5,000,000 tons of ore.

The steel mills of the Chicago and Gary districts receive annually by lake about 8,000,000 tons of iron ore and the freighters which bring it return empty. With Illinois coal costing one dollar less per ton than the present price, freighters could make a rate for delivery at upper lake ports and compete successfully with freighters carrying Eastern coal.<sup>1</sup>

In 1920 Illinois produced about 214,000,000 bushels of grain from the area within forty miles of the Illinois Waterway.<sup>2</sup> In 1921 the Port of Chicago shipped 78,000,000 bushels of corn by Great Lakes water carriers. This quantity equals sixty-three percent of the 1920 corn production of the state within forty miles of the waterway. It will be possible to haul the export portion of the grain produced in this area, by trucks to the waterway and in barges to either Chicago or New Orleans at rates materially lower than rail rates.

Chicago lumber receipts and shipments for 1907 were 3,457,204,000 feet, and for 1917 were 4,873,000,000 feet of which receipts, 1,500,000,000 feet<sup>3</sup> were from Southern States and which could more cheaply move by way of the Illinois Waterway.

-----  
<sup>1</sup>Barnes, M. G., Commercial Aspects of the Illinois Waterway, p. 13.

<sup>2</sup>This estimate was arrived at by the use of figures from the 1920 U. S. Census.

<sup>3</sup>U. S. Census, 1920.



## Joliet.

Joliet, with its environs, has a population of some 60,000. Its most numerous industry is the quarrying and crushing of stone. The industry employing the greatest number of people is steel. For instance, wire, rods, railroad spikes, angle bars, nuts and bolts are made in Joliet cheaper than any other place in the world. There are more wallpaper mills in Joliet than in any other city this side of the Allegheny mountains. The largest art calendar factory in the world is in Joliet. There are numerous agricultural and other machinery-making establishments. There are also railroad shops, wire mills, horseshoe, toe-calk, automobile, chemical, matches, coke, carton and box-making industries.<sup>1</sup>

Joliet is an important railroad point. In the accounts of the Michigan Central Railroad it is of greater importance than Chicago.<sup>2</sup> The dam at Brandon Road will create a large pool probably a half mile wide affording anchorage for vessels and a lay-up point for winter and repairs. The Chicago, Rock Island and Pacific, the Santa Fe and the Chicago and Alton Railroads have ready access to this Brandon pool and will doubtless find it to their interest to construct tracks alongside it. The Chicago Outer Belt line--the Elgin, Joliet and Eastern Railroad--crosses the main channel and already has tracks along its shores. The natural sequence is that great quantities of freight will be broken in Joliet and shipments made from that point.

The Association of Commerce of Joliet cites as evidence of the tendency of the Illinois Waterway to act as a loadstone to manufacturing interests, the fact that a Chicago broker during the summer

<sup>1</sup>Information supplied by the Association of Commerce of Joliet.

<sup>2</sup>Gardner, H. C., Commercial Need Turns to Waterways, Illinois Journal of Commerce, June, 1921.





of 1921, when work at last was started on the waterway, requested the Association to assist him in finding suitable buildings for three manufacturing plants. Buildings having about 30,000 feet of floor space were desired.<sup>1</sup>

Another great saving will follow in the wake of the completion of this canal. Cars destined for interior and north side points in the city of Chicago will be run onto great switching barges and instead of taking weeks in finding their destinations and in many cases, being totally lost, will get to their consignees in a single day. In other words the Sanitary Canal will become a great switching yard for many railroads.

#### Ottawa

Ottawa, situated at the confluence of the Illinois and Fox Rivers, is within the bounds of La Salle county. This county ranks second in Illinois and fifth in the United States in value of agricultural products.<sup>2</sup> Within a ten-mile radius of the city is found the highest grade of silica moulding sand and glass sand in America. This is the commercially famous Ottawa sand, large quantities of which are used by every steel company and foundry from St. Louis to Gary and to points along the Ohio River and the Great Lakes. There are twenty plants in and about the city that depend entirely upon the mining of silica sand, and the approximate mined tonnage annually is about one million tons. With the waterway opened it is estimated that this district will ship 5,000,000 tons annually.<sup>3</sup>

<sup>1</sup>-----  
<sup>1</sup> Illinois Journal of Commerce, August, 1921.

<sup>2</sup> Hill, H. T., General Secretary, Illinois Chamber of Commerce, Illinois Journal of Commerce, July, 1921.

<sup>3</sup> Ibid.



Along the banks of the waterway in this neighborhood are found also, inexhaustible deposits of sand and gravel mixed by nature in the proper proportions for concrete so that after separation by screening there remains a very small percentage of waste material. Chicago's annual consumption of sand and gravel is over 3,000,000 cubic yards.<sup>1</sup>

### La Salle

At the head of navigation on the Illinois River, is La Salle a city of 13,000 people and the trading center of a section with 50,000 residents.<sup>2</sup> The industrial directory of the city includes zinc smelters and rolling mills, cement mills, clock works, chemical plants, a machine and tool factory, brick and tile plants, an artificial ice factory, and coal mines in the environs.<sup>3</sup>

Speaking before nearly 200 representative business men of Illinois on June 16, 1921, when they were participating in a conference held in various cities along the Illinois River for the purpose of advancing the cause of the Illinois Waterway, Mayor P. E. Coleman of La Salle said in part:

"It may be surprising to you to know that from La Salle there is shipped out annually approximately 5,000,000 tons of freight. Our cement plants, three in number, produce annually about 1,500,000 tons. Our coal mines, in addition to supplying the local industries, ship to consumers elsewhere approximately 750,000 tons of coal. Our zinc plants are also producing great quantities of zinc, about 150,000 tons each year, and when you take into consideration the fact that on a pre-war basis the annual production of zinc in the world was -----

<sup>1</sup>Barnes, M. G., Commercial Aspects of the Illinois Waterway, p. 13.

<sup>2</sup>U. S. Census, 1920.

<sup>3</sup>Report of the La Salle Chamber of Commerce, 1921.



about 350,000 tons, you can readily realize that in the zinc world at least this community is an important factor."

The freight tonnage of the La Salle district is fourth in the state. Only Chicago, East St. Louis and Peoria outrank La Salle in heavy shipping. A large proportion of the manufactured products of this district is made up of heavy commodities, such as coal, cement, sand, gravel and manufactured zinc, as well as agricultural implements and the products of foundries. This part of the valley is also a fertile, productive region and the movement of agricultural products is heavy.

With river improvement and the canal connection, the La Salle district can move a portion of the five million tons of heavy commodities in and out by water and thus relieve the congestion that often occurs on the railroads. This city would then become a river port for the shipment of commodities that would come in from the North, to be transferred to boats and barges.<sup>1</sup> (See the map on page 9, for the strategic geographical location of La Salle.)

Near the city is Starved Rock in the Illinois State Park, a site of historic interest to every resident of the state, for it was from this point that La Salle and Tonti conducted their important civilizing operations for their royal French master.

### Peoria

Peoria, the fifth city of great industrial importance, is midway between Chicago and the mouth of the Illinois River at Grafton. Her grain business annually amounts to \$50,000,000, her beef packing industry to \$35,000,000, her wholesale and jobbing upwards of

<sup>1</sup>Illinois Journal of Commerce, June, 1921.





\$45,000,000, her retail industry upwards of \$35,000,000.

Over six hundred plants manufacture over one thousand articles, employ 20,000 people, have a total annual payroll of \$8,000,000, and a total annual product of \$200,000,000. In 1910, after careful estimate, it was figured that Peoria was turning out \$64,000,000 worth of goods a year. A recent survey by outside experts estimated that the annual product amounted to \$200,000,000.<sup>1</sup>

Peoria is situated in a rich agricultural and coal area, and is the terminus of fourteen steam railroads and three electric lines. Its chief industry is the production of agricultural implements and tractors, paper and paper products, wire and steel, metal and foundry supplies, stoves and furnaces, cereal products, beef products, textiles, rope and cordage.

Alton on the Mississippi, and St. Louis the focal point of the waterway system of the United States, as well as many other northern and southern Mississippi River points, and cities on the Ohio and Missouri Rivers, will contribute to the Illinois Waterway tonnage.

#### Important Industries and Natural Resources.

During the year 1921 and part of 1922, the Illinois Journal of Commerce ran a series of articles on features of the state, entitled, "What Illinois is Proud of". The articles dealt with the most outstanding of the many important industries and natural resources of great commercial value possessed by the state.

An article on Coal by Dr. F. C. Honnold, Secretary-Treasurer, Illinois Coal Operators Association, appeared in the June, 1921, issue. It appears from his article, that although coal is produced from 938

-----  
<sup>1</sup> Figures furnished by the Association of Commerce of Peoria, 1921.



mines in fifty-three of the 102 counties in Illinois, it is shipped by rail from only 373 of these mines located in thirty-eight counties; the other 565 mines being small and supplying only local needs.

Plate V, page 39, shows the production of coal, in a graphical manner, in such of the thirty-eight counties producing 1,000,000 or more tons annually.

The 373 shipping coal mines in Illinois are served by forty railroads whose combined tonnage for all farm and forestry products and all metals transported by them does not equal the coal they handle.

The six major coal carrying lines in Illinois and their annual tonnage of coal hauled is:<sup>1</sup>

Railroad	Counties	Mines	Tons Shipped	Percentage of Freight Handled
Illinois Central	21	110	9,500,000	44.6
Chicago, Burlington, & Quincy	11	65	9,250,000	36.2
Big Four	8	37	4,600,000	50.4
Chicago & Alton	9	30	2,500,000	41.3
Chicago & Eastern Illinois	6	28	2,300,000	60.4
Missouri Pacific	2	30	2,100,000	----

During the past fifteen years, Franklin County, southern Illinois, and within forty miles of the Mississippi and Ohio Rivers, has grown to be the World's largest coal producing county. There were in 1921 twenty-six coal mines, producing during the year 12,000,000 tons. At that time, although practically every acre of mineral rights had been purchased, only a small area had been mined out. Hundreds of thousands of acres were still undeveloped.<sup>2</sup>

Franklin's coal history reads like the record of a treasure hunt. In 1892 a few of the citizens of the county seat town of Benton drilled for coal. After going to a depth of 584 feet they became

<sup>1</sup>Honnold, F. C., Illinois Journal of Commerce, June, 1921.

<sup>2</sup>Snyder, J. D., Secretary of the Benton Commercial Club, Franklin County's Development, Illinois Journal of Commerce, September, 1921.

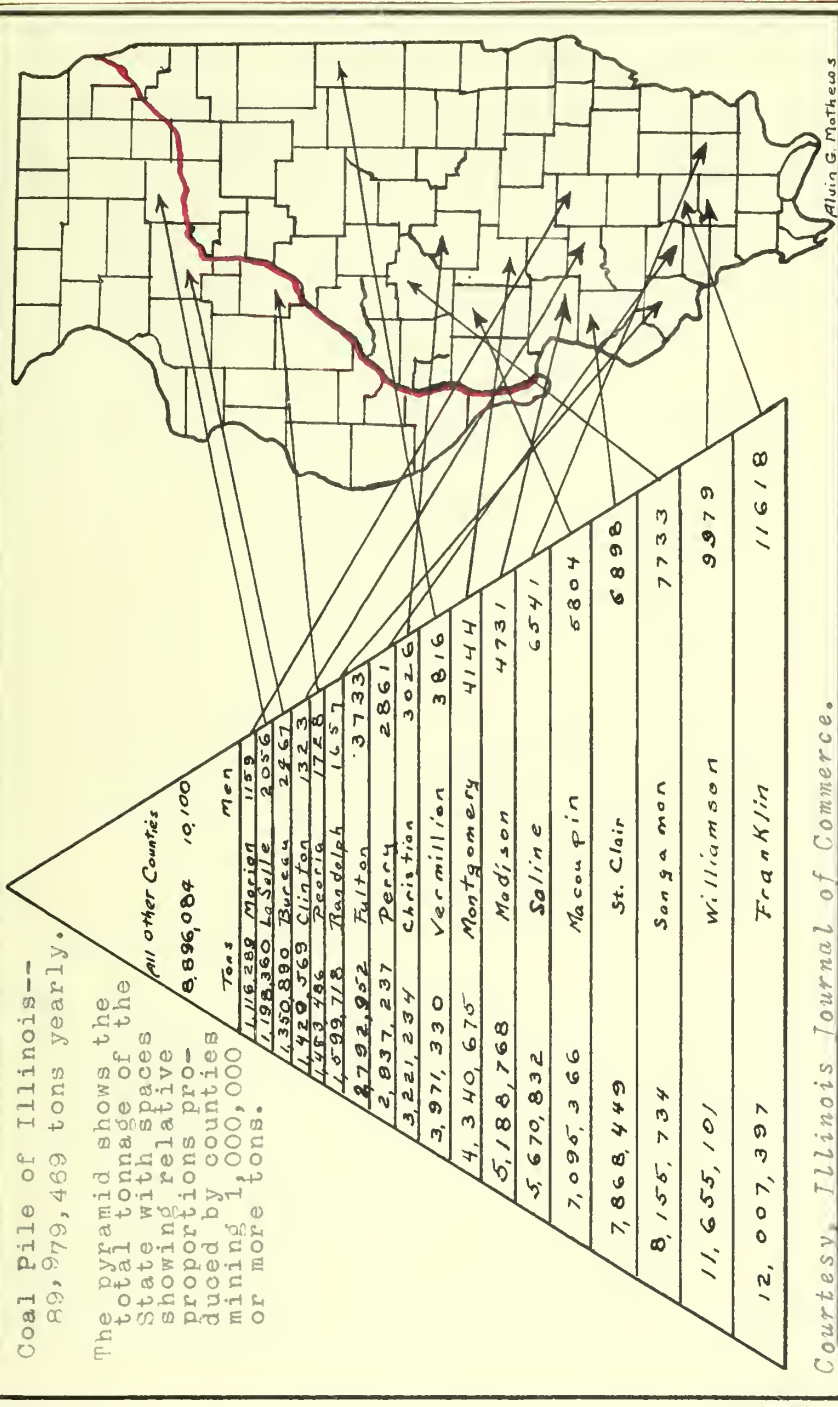


## PLATE V.

## PREMIER COAL PRODUCERS

Coal Pile of Illinois--  
89,979,469 tons yearly.

The pyramid shows the  
total tonnage of the  
State with spaces  
showing relative  
proportions pro-  
duced by counties  
mining 1,000,000  
or more tons.



Courtesy, Illinois Journal of Commerce.

Alvin G. Matthews





discouraged and abandoned the hole. The drill, at the time they stopped, was within fifty feet of discovering a real Eldorado for this section of the country. The next prospecting was done a few years later by Captain W. P. Halliday, of Cairo. The results of his prospecting, however, were not disclosed until long after his death. He had discovered the great coal deposits from which the Central and many of the Western states were to be supplied for the next century. Captain Halliday had expected to purchase 100,000 acres in the heart of Franklin County.

Joseph Leiter became familiar with the great coal deposits and purchased about 10,000 acres upon which was located the famous Leiter mine. Scores of similar tracts have since been purchased by coal corporations, until at the present time there are very few acres of Franklin County coal land unsold.

The largest coal mine in the world is located at Orient and owned by the Chicago, Wilmington & Franklin Coal Company. The world's largest coal washer is located at Benton, owned by the United States Steel Corporation.<sup>1</sup>

Franklin County coal is fast supplanting the Hocking coal from Ohio, the Splint coal from West Virginia, and the Pittsburgh coal in the northwest and south. During the war it was substituted in the northern states for anthracite. Recent investigations have disclosed that it is a coking coal of high quality, so valuable as a metallurgical coke that the United States Steel Corporation purchased 40,000 acres with a view to using it in its by-product ovens at Gary<sup>2</sup>

<sup>1</sup>-----  
Snyder, J. D., Franklin County's Development, Illinois Journal of Commerce, September, 1921.

<sup>2</sup>Ibid.



and South Chicago.

Illinois Coal is sold for commercial use in substantial quantities in some fourteen states, and in round numbers, as to relative amount, in about the following order:<sup>1</sup>

Illinois	30,000,000
Missouri	8,500,000
Iowa	4,000,000
Wisconsin	2,500,000
Minnesota	2,200,000
Indiana	1,500,000
Michigan	750,000
Nebraska	350,000
South Dakota	200,000
Miscellaneous	<u>2,000,000</u>
	52,000,000

In addition to the above, the sale of coal to railroads, and the production of coal by industrial companies for their own use, amounts each year to about 32,000,000 tons, which makes up the average production of a normal year, or about 80,000,000 tons.

"Present Illinois coal mines have an annual productive capacity of 125,000,000 tons if worked 300 days of eight hours each. The coal is always there to load, and except in rare cases, plenty of miners to dig and load it."<sup>2</sup>

### Economic Saving Through Handling Coal by Water.<sup>3</sup>

It has been estimated that upon the completion of the Illinois Waterway, 15,000,000 tons of coal will seek transport over the Illinois and Mississippi Rivers to Chicago and points north. Should this take place much railroad property required in normal times will be released for the transportation of other commodities. An estimate of the cost of such property is obtained in the following

<sup>1</sup>-----  
<sup>1</sup>Honnold, F. C., Illinois Journal of Commerce, June, 1921.

<sup>2</sup>Ibid

<sup>3</sup>Barnes, M. G., The Illinois Waterway, p. 16.



manner:

Most of the Illinois coal that reaches Chicago comes from the southern counties and from the Springfield district, distances ranging from 180 to 300 miles by rail or an average of say 240 miles. The average rate of speed for cars on railroads in the United States is about thirty miles per day and the capacity of coal cars is about fifty tons. It is estimated that loaded trains will be made up of forty cars and empties of eighty cars. Under these assumptions the following figures are derived. One car would make 23 round trips per year (assuming constant use) and haul 1,150 tons per annum. It would, therefore, require 13,040 cars and 200 locomotives to transport 15,000,000 tons of coal to Chicago. The value of this property is:

13,040 cars at \$3,000 each	\$39,120,000.00
200 locomotives at \$50,000 each	10,000,000.00
	<hr/>
Total value of rolling stock	\$49,120,000.00

The Interstate Commerce Commission estimates that cars and locomotives on the railroads of the United States amount to twenty-one percent of the total value of all railroad property. If this is true, the total value of all railroad property released in the transportation of coal alone, by the construction of the Illinois Waterway, is \$234,000,000. It will require about \$30,000,000 to \$35,000,000 worth of property to transport this amount of coal by water including the terminal facilities, or a net saving of \$200,000,000.00 worth of transportation property, which at six percent interest amounts to \$12,000,000.00 annually.

The rail rate on coal from Southern Illinois to Chicago is \$2.17 per ton. It has been estimated that with the completion of the





Illinois Waterway fleets of barges with a capacity of 9000 tons can transport this coal up the Mississippi and Illinois River to Chicago at a saving of \$1.00 per ton. This does not seem unreasonable in the light of experience on other waterways transporting similar commodities. Coal is hauled on the Great Lakes, a distance of 1000 miles at thirty cets per ton. In 1920, 21,000,000 tons of coal were transported over the Monongahela River to Pittsburgh in smaller barges and through smaller locks than will be used on the Illinois River, a distance of sixty-five miles, for less than ten cents per ton, while the railroad charge for the same distance was eighty-five cents per ton.

In the construction of the Illinois Waterway there will be developed as a by-product about 55,000 h. p. yrs. of electric power. This will result in an annual saving of 550,000 tons of coal as ordinarily developed in steam plants. The saving of this amount of coal would release \$1,800,000.00 worth of rolling stock or \$8,500,000.00 worth of rail property. At six percent interest this shows an annual saving of \$510,000.00. Statistics of the U. S. Census show that the consumption of power from central power stations in the United States is about 160 h. p. per thousand of population. At this rate the power developed is sufficient for a population of 344,000 people; five percent of the total population of the State.

The current prices of the coal f.o.b. mines in Illinois and Indiana and rail rates to Chicago are shown in the following table:

#### SOUTHERN ILLINOIS

Freight rate to Chicago \$2.17

Prepared sizes

\$3.50--4.05



Mine Run	\$2.75--3.00
Screenings	1.85--2.25

## NORTHERN ILLINOIS

Freight rate to Chicago \$1.54

Prepared sizes	\$4.25--4.50
Screenings	2.50--3.85

## SPRINGFIELD DISTRICT (CENTRAL ILLINOIS)

Freight rate to Chicago \$1.83½

Prepared sizes	\$2.75--3.50
Mine Run	2.25--2.75
Screenings	1.75--1.95

## INDIANA, FOURTH VEIN COAL

Freight rate to Chicago from Sullivan County, \$1.92;

from Clinton, \$1.78

Prepared sizes	\$3.00--3.75
Mine Run	2.60--2.90
Screenings	2.00--2.25

## INDIANA, FIFTH VEIN COAL

Freight rate to Chicago from Sullivan County, \$1.92;

from Clinton, \$1.78

Prepared sizes	\$2.60--3.00
Mine Run	2.25--2.60
Screenings	1.50--1.75

This table shows an average of about \$2.65 per ton for mine run coal f.o.b. cars at the mine at an average freight rate of \$1.87 per ton, or a total of \$4.52 per ton f.o.b. cars at Chicago. At these prices, the value of coal saved annually by the development of power along the Illinois Waterway amounts to \$2,486,000.00. If the



price of coal and freight are finally reduced to \$3.00 per ton, the saving would amount to \$1,650,000.00 annually.

The total benefit from the transportation of coal by water and the saving in coal due to the development of power along the Illinois Waterway is as follows:

Interest on transportation property released	\$12,510,000.00
Coal saved by development of power along the waterway	1,650,000.00
Saving in transportation on 15,000,000 tons of coal at \$1.00 per ton	15,000,000.00
Total annual saving	<hr/> \$29,160,000.00

Before the war the cost of producing power in the United States by steam was \$70.00 per h.p. per year. If power developed incident to the construction of the Illinois Waterway is sold at \$30.00 per h.p. per year, the annual saving will amount to \$40.00 per horse power or \$2,200,000 annually. This is five percent on \$44,000,000. Computed on the saving of coal only, i.e. \$1,650,000.00 annually, this power represents at five percent interest a capital of \$33,000,000.00.

The development of one horse power saves the labor of thirty-five men per year. The development of 55,000 horse power is equivalent to the labor of 1,925,000 men annually.

The benefits to be derived from cheap hydro-electric power obtained from Niagara Falls has been heralded far and wide. The wheels of commerce and transportation through a radius of 200 miles from Buffalo receive their energy from the falls of the Niagara River. Yet as great as this power is it does not equal the power developed by steam in the Chicago district. Every pound of this





coal is transported to the power houses for a distance of over half the length of the State. This coal comes from near the banks of navigable waters of southern Illinois. Practically all of it should and could be brought to Chicago by water and could be delivered to the very doors of the great power plants at an annual saving to tax payers of northern Illinois sufficient to pay four percent dividends on the entire cost of the waterway.

As startling as these figures are, they only tell of the benefits of the handling of one commodity--coal.

The world is coming to appreciate the world primacy of Illinois in that industry which is at once essential to agriculture and of importance in commerce--the manufacturing of farming machinery and implements.

According to the abstract of the Census of Manufactures issued by the Census Bureau, the United States produced in 1914, farm machinery valued at \$164,086,835, of which Illinois alone produced \$65,337,663, or about forty percent of the country's total production. The preliminary figures in the 1920 Census, give the value of the farm implement industry's products in the United States in 1919 as \$304,961,000, or a little less than twice the total for 1914. No information has yet been given out as to the rank of Illinois with respect to farm implement production in 1919, but it is to be assumed that its proportion of the nation's output did not decrease between 1914 and 1919.

That this is not a transient domination is shown by the fact that in 1909<sup>1</sup> Illinois made \$57,268,325 worth of farm implements  
-----  
<sup>1</sup>U. S. Census, 1910.



out of \$146,329,269 for the nation, or a little better than thirty-nine percent.

In the September, 1921, issue of the Illinois Journal of Commerce, DeWitt C. Wing, Managing Editor of the Breeder's Gazette, speaks of the live stock industry of Illinois as being one of steadily increasing importance although of rather recent attention at the hands of most farmers.

Grain-farming is like mining: it takes wealth out of the land, and ships it out of the community. The virgin stocks of soil fertility made agricultural lands comparable to a bank, full to overflowing with deposits. Thousands of "patrons" drew lavishly upon the bank's original capital for many years, until in some regions the "Bank" was approaching insolvency. Consequently, a mixed system of farming, involving the breeding and feeding of live stock, is being largely adopted to conserve the original capital of the soil.

Illinois has more than 250,000 farms, on which cattle are raised on ninety-one percent, hogs on seventy-five percent, horses on ninety-three percent and sheep on ten percent, according to the 1920 census.<sup>1</sup> During the next five years a marked increase in the total amount of live stock and an equally marked increase in its breeding and usefulness are fore-ordained by the cheapness and abundance of corn and other grains, by the declining yields of crops on grain farms, by the restoration of American industry, by the low prices of breeding stock, and by the growing popular knowledge of the scientific soundness of the stock-farming system.<sup>2</sup>

<sup>1</sup>Wing, D. C., The Live Stock Industry, Illinois Journal of Commerce, September, 1921.

<sup>2</sup>Ibid.



The numbers of cattle, hogs, sheep, and horses and mules in Illinois in 1920 are as follows:<sup>1</sup>

Cattle	2,395,000
Hogs	4,585,000
Sheep	889,000
Horses and Mules	1,470,000

Speaking before the Southern Illinois Conference held at Benton, September 16, 1921, Frank W. DeWolf, Director of the Illinois Geological Survey, brought to light some pertinent information concerning Illinois' mineral deposits.<sup>2</sup> Although not recognized as a great producer of minerals Illinois ranks fourth among the states of the Union, and in 1918 yielded mineral products from domestic sources valued at more than \$271,000,000. Of this production southern Illinois was responsible for at least forty-five percent of the total, the Baltimore and Ohio Southwestern Railroad, which crosses the state from East St. Louis to Lawrenceville, being taken as the northern boundary of "Southern Illinois".

Of the minerals other than coal that are native to southern Illinois, the most important are petroleum, clay and clay products, fluorspar, stone and tripoli or amorphous silica. The silver production of Illinois, valued at approximately \$8,000 a year and produced as a by-product of fluorspar mining, is of passing interest only.

"Besides the fields I have spoken of (referring to established Illinois oil fields), there has been a great interest in southern Illinois in such communities as Benton, Harrisburg, DuQuoin and all the large communities. It is altogether likely that some oil will be -----  
U. S. Census, 1921.

<sup>2</sup>Reported in the Illinois Journal of Commerce, October, 1921.





found here and also in Western Illinois, but it is very difficult to find the places to drill because your rocks are buried under many feet of glacial drift, so that it is impossible for the geologists to see the rocks. Fortunately, however, from a study of views of core records and water-well records, the survey has been able to work out the structure in many places."<sup>1</sup>

The latest complete figures on the mineral resources of Illinois are as follows:<sup>2</sup>

Coal	\$206,860,291
Petroleum	29,111,851
Fluorspar	2,430,361
Limestone	2,951,045
Clay	413,901
Tripoli	18,902
Ganister, Novaculite	58,007
and crude Tripoli	

Illinois' underground oil supply amounts to 440,000,000 barrels or five percent of the nation's total reserve. At the present rate of production this supply will last forty years, or twice as long as the nation's supply. The Illinois reserve is more than twice as large as that of West Virginia or Ohio, nearly twice as large as that of Pennsylvania and more than four times as large as that of New York.<sup>3</sup>

Sand is the cheapest commodity on earth sold in bulk. It is the only commodity so inexpensive that the cost of transporting it is

<sup>1</sup>DeWolf, F. W., Mineral Deposits of Illinois, Address, Sept. 16, 1921.

<sup>2</sup>DeWolf, F. W., Director of the Illinois Geological Survey.

<sup>3</sup>These calculations are the result of a study made jointly by the United States Geological Survey and the American Association of Petroleum Geologists.



often two or three times the value of the material at the source of supply. About 4,000,000 tons were produced and sold in the State of Illinois in 1921.<sup>1</sup> The Illinois River, the Fox River, and The Rock River, possess good deposits of sand and gravel besides those found in the bed of the Mississippi.

Probably the largest single use for sand and gravel is found in the modern concrete highway. Every mile of hard road of average width contains approximately 2,000 tons of sand and 3,000 tons of gravel or crushed stone. Approximately 1,200 miles of new concrete roads and streets will be built in Illinois during the year 1922.<sup>2</sup>

Speaking before the Business Building Conference of Illinois held during January, 1922, Herman H. Hettler, President of the Illinois Manufacturers' Association, credits Illinois with destiny to become the manufacturing center of the world, because of its raw material, unlimited supply of fuel, soil of surpassing fertility, unexcelled transportation facilities and "climate conducive to industrial pep".<sup>3</sup>

The last government census of Illinois Factories for the year 1919, shows that the value of products in the state amounted to \$5, 426,652,000 or a gain of 14.15 percent over the previous census conducted in 1914.<sup>4</sup> There was paid out in wages by 18,594 plants the enormous sum of \$801,610,000 or a gain of 135.1 percent in five years, and 805,008 persons were engaged in manufacturing in these establishments--an increase of 30.3 percent in the five year period.<sup>5</sup>

<sup>1</sup>-----  
Pierce, J. D., Secretary, Illinois Concrete Aggregate Association, Sand and Gravel of Illinois, Illinois Journal of Commerce, March, 1922.

<sup>2</sup>Ibid.

<sup>3</sup>Reported in the Illinois Journal of Commerce, February, 1922.

<sup>4</sup>U. S. Census, 1914.      <sup>5</sup>U. S. Census, 1920.



Illinois ranks third among the industrial states--the value of her manufactured products being exceeded only by New York and Pennsylvania<sup>1</sup>--states which had a start over Illinois in industrial fields of more than 100 years and possess the advantage of a location on the seaboard.<sup>2</sup>

A tinge of color is added to the composite picture of the resources of Illinois, when it is known that the growth of Chicago as the great central market has brought about the development there of the public warehouse idea to a much greater extent than in any other distributive center.

J. E. Lee, President of the Illinois Association of Warehousemen, has this to say about warehouse facilities in the state; "There are at the present time approximately forty established warehouses in the city of Chicago handling general merchandise storage. This is exclusive of cold storage and household furniture warehouses.<sup>3</sup> Peoria, Joliet, Aurora, Springfield and other cities contribute to the state's total warehousing capacity. The merchandise handled by these institutions will total more than one and a quarter million tons per year.<sup>4</sup>

-----  
<sup>1</sup>U. S. Census, 1920.

<sup>2</sup>The importance of the Illinois Waterway as a vital factor in the future manufacturing supremacy of Illinois is indicated by this news item from the Illinois Journal of Commerce for February, 1922. "Construction of the Jones and Laughlin Steel Company's new mills at Hammond, Indiana, waits upon the opening of waterway transportation to New Orleans by the Calumet River, the Sag and Drainage Canals, and Illinois and Mississippi Rivers."

<sup>3</sup>Lee, J. E., Warehouse Facilities of Illinois, Illinois Journal of Commerce, February, 1922.

<sup>4</sup>Ibid.





### Contiguous Territory Tributary to the Waterway.

Inasmuch as the two general principles of rate making, cost of service and value of service, will guide the Illinois Waterway carriers in compiling their tariffs, it follows that any commodity produced along the banks of the waterway, near enough to a loading pier to be practically free of any land transportation costs, can be shipped over the Illinois Waterway more cheaply than by competing means of transportation. This will be true even, in a good many cases, when the water route is the indirect one, as long as the additional mileage does not eat up the saving of the water rates over the indirect one.

Exactly the same thing is to be said about arrival of the goods at their destination. As long as this destination is along the banks of the waterway or some water arm of the system, there can be no doubt about the advantage of the waterway over other existing means of transportation. In other words, as long as the commodity is produced and consumed or exported entirely at points located on some connecting link of the internal waterway system, the freight charges will be less than by rail. The distance of the haul matters not in the least. Whether it be for ten miles or a thousand miles, the charge per ton-mile can be less than the rail carrier's charge per ton-mile for the same haul. With rail carriers as with water carriers such charges as terminals, damage, and administration are fixed definite costs per ton regardless of the length of the haul, while others, mainly those of haulage, vary almost directly with the mileage.

Contrary to the general opinion, water transportation is just as expeditious on the average as rail carriage. While the barges do not make as high speed as freight cars, their speed is steadier.



Though the freight car may occasionally travel twenty miles in an hour and the barge almost never over five, yet either will make about the same number of miles in a day. This is true because of the congestion at rail terminals, the great amount of switching that must be done, the waiting for hours at a siding to permit a faster train to overtake and pass, and the immense amount of package freight handled by rail carriers. The canal barge, on the other hand, moves steadily though slowly, if it is an express, straight to its destination without stopping. If it is handling package freight it stops only long enough at each port to discharge and take on the freight. There are no delays from congestion, right of way, or switching. Lockage does not require over an hour. The situation is the classical one of the hare and the tortoise.

There is no question either, when a waterway is a link in a joint direct route between two points, that a cheaper rate may be worked out than if an all rail route were used, provided the cost of reloading at the transition point does not become as great as the saving effected. The length of the water haul is the determining factor in a case of this sort.

It is only when the waterway attempts to draw trade from points not located on its banks, which are in direct line with the shipping destination by rail but which in order to move by water must use a truck or rail shipment at either or both ends of the water haul, that a serious problem in the determination of trade area arises. Pinckneyville, shipping coal to Chicago, is in direct connection with it by rail, but is thirty miles from the Mississippi and water connection. The implement manufacturers in Chicago have good rail connections to Mt. Sterling, which is fifteen miles from the Illinois



River. When the barge service on the Illinois Waterway is in operation will the coal mining company at Pinckneyville find it profitable to truck their coal to the river, build a narrow gauge line, or use an existing feeder line, in order to take advantage of the cheap water rates, instead of using the direct rail service? Can the dealer at Mt. Sterling make more profit for himself or a lower price to his customers, if he orders his farm machinery shipped by water to Beardstown, from which point, it will have to move by rail or truck to Mt. Sterling, instead of using rail the entire distance?

Upon the solution of such problems as these, depends the estimate of the size of the contiguous area that may be considered as a freight tributary in this survey of potential tonnage for the Illinois Waterway. For commodities of high value and small bulk, motor trucks are now meeting the competition of railroads for fifty to one hundred and fifty miles.<sup>1</sup> For commodities of low value and high bulk, distances which trucks can compete with railroads are much less. In general, it is true that the distance out of direct line for which it will be profitable to truck goods to the Illinois Waterway varies directly with their value and indirectly with their bulk.

After a very extensive study of Inland Waterways and Transportation Costs,<sup>2</sup> Mr. M. G. Barnes came to the conclusion that the extreme boundary of the territory tributary to the Illinois Waterway, should be set at forty miles from the waterway. The waterway cannot hope to draw all the long haul existing tonnage from this area but it should draw a good part of it from the outer edge with a steadily increasing percentage as the distance shortens until practically all

<sup>1</sup>Patton, A. E., Some Economic Aspects of Motor Truck Transportation, p. 56-61.

<sup>2</sup>Barnes, M. G., Inland Waterways and Transportation Costs, p. 18.





of it may be counted on at the water's edge. The ratio of low value goods to high value goods in tons, will increase as the course of the waterway is approached. Mr. Audley E. Patton in an investigation carried on during the winter and spring of 1921-22, for the purpose of determining motor truck transportation costs,<sup>1</sup> came to conclusions similar to these just stated.

This forty-mile area in Illinois is shown on the map of the state in Plate VI, page 56. It is stated that seventy-seven percent of the area and eighty-six percent of the population of Illinois are within forty miles of navigable waters.<sup>2</sup> The plate also shows the coal and grain production in that part of the forty mile area which will affect tonnage on the Illinois Waterway most directly. Plate VII, on page 57, shows the proposed hard road system for Illinois. It will be noted that many roads connect with the Waterway and when completed will be admirable trucking highways. The hard road construction is being pushed along rapidly, the quota for 1922 being 1000 miles. Plate VIII, on page 58, shows the railroad lines now existing which will become feeders for the Waterway on account of their connection with it.

#### Exports and Imports.

Out of thirty-eight exporting customs districts in the United States only five, during the first nine months of 1921, showed increased export values over the corresponding period of the preceding year. The Chicago district's increase, from \$25,354,000 to \$42,662,000 was the largest.<sup>3</sup>

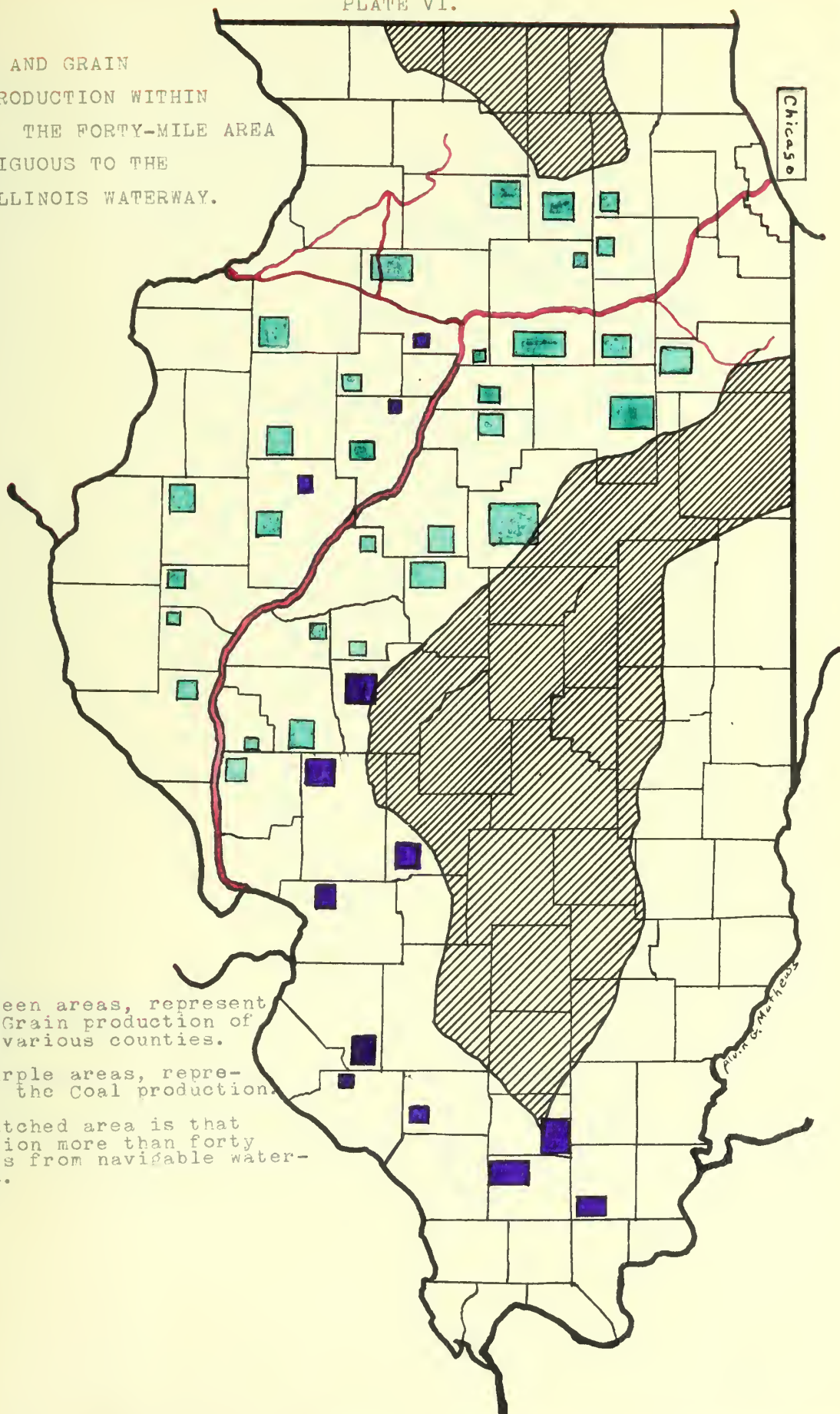
<sup>1</sup>Patton, A. E., Some Economic Aspects of Motor Truck Transportation, p. 57.

<sup>2</sup>This estimate is based on figures from the U. S. Census, 1920.

<sup>3</sup>Foreign Commerce Department, Our World Trade, 1921, U.S. Cham. of Com.



COAL AND GRAIN  
PRODUCTION WITHIN  
THE FORTY-MILE AREA  
CONTIGUOUS TO THE  
ILLINOIS WATERWAY.



The Green areas, represent  
the Grain production of  
the various counties.

The Purple areas, repre-  
sent the Coal production.

The Hatched area is that  
section more than forty  
miles from navigable water-  
ways.



PLATE VII.

THE HARD ROADS PLAN FOR ILLINOIS



LEGEND

Paving Completed —

Roads under construction  
and roads upon which work  
has not been started —

The shaded area is that section  
of the State which is more than  
40 miles from navigable waters.









RAILROADS CONNECTING  
WITH THE  
ILLINOIS WATERWAY



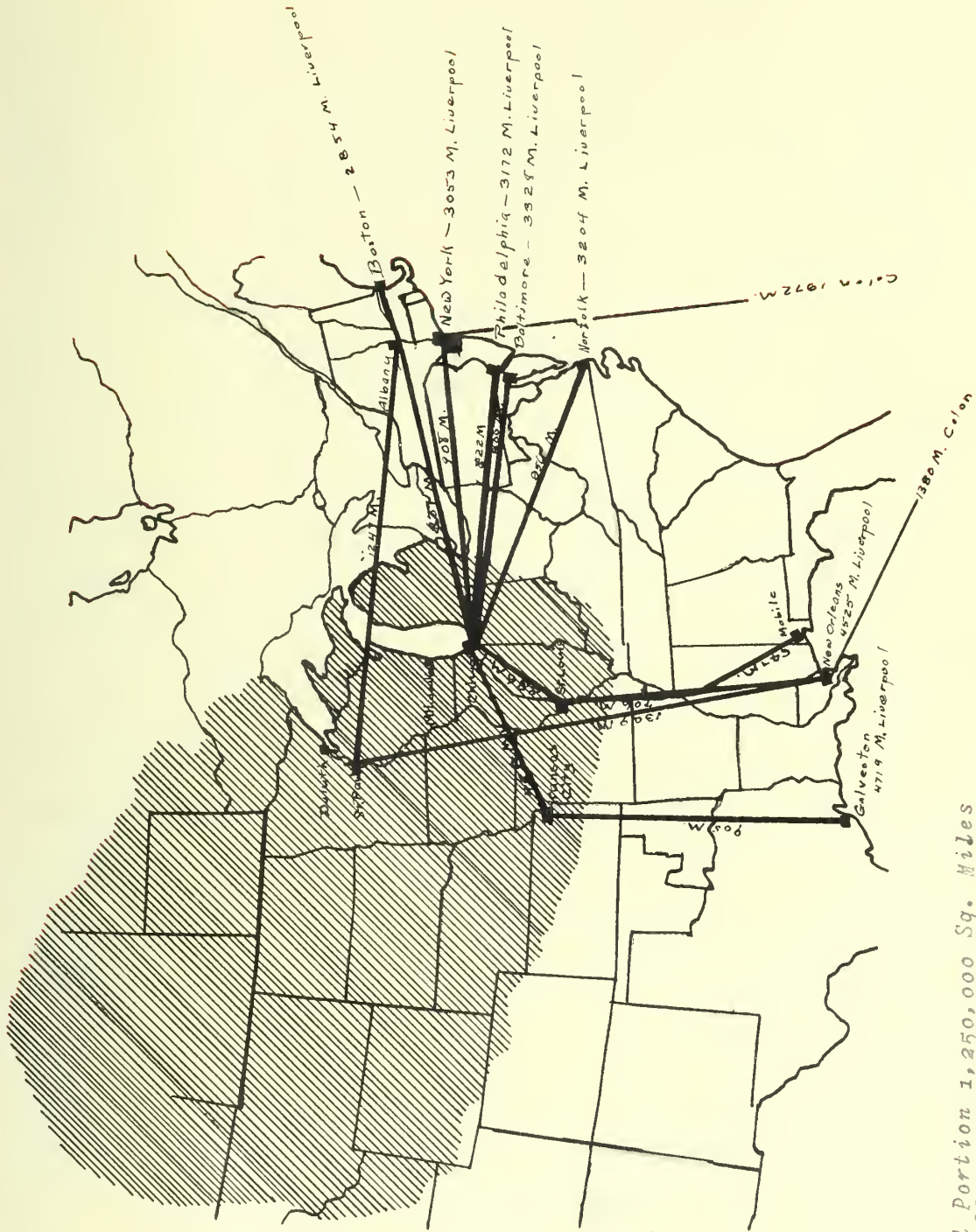
The foreign and domestic commerce of the principal Gulf ports in 1913 amounted to over sixteen million tons.<sup>1</sup> These ports are all either now connected, or very soon will be connected, by an inland water route with the Mississippi River. The present tonnage between St. Louis and Chicago is approximately 2,500,000 tons annually, equally divided between north and south bound freight. On the Mississippi River from St. Louis to its mouth is found the great cotton, rice and cane sugar belt of the United States where fifty-six percent of the cotton, ninety-two percent of the rice, and practically all of the cane sugar produced in the United States are raised.

In addition to these crops, vast quantities of the products of mines and forests are also produced. Sugar refineries of Louisiana have increased their \$12,000,000 output in 1890 to about \$64,000,000 in 1909, and are the largest sugar refineries in the world. At the upper end of the valley the Twin Cities and Chicago are the receiving and distributing points of the grain belt, raising annually approximately 5,000,000,000 bushels of grain and vast herds of live stock. The area and destination of export grain is shown by Plate IX, page 60. The commerce of Chicago, as reported by the Chicago Board of Trade, amounted to about 22,000,000 tons in 1897, and over 40,000,000 tons in 1907, nearly doubling in that decade. The total manufactures of Chicago in 1919 were \$2,464,241,250. The value of the wholesale trade exceeded \$3,000,000,000. For that year the total foreign commerce for the United States was approximately \$9,000,000,000.

The Department of Commerce and Labor computes that the value

-----  
 The figures in the following paragraphs dealing with foreign trade, are taken from the brochure prepared by M. G. Barnes, entitled, Inland Waterways and Transportation Costs, pp. 22-26.





Area Shaded Portion 1,250,000 Sq. Miles  
 Population 30,000,000  
 Grain Production 5,000,000,000 bushels

AREA AND DESTINATION  
 OF  
 GRAIN EXPORT TRADE

Alvin G. Matthews







of the export trade is approximately \$36.00 per ton, and the import trade \$63.00 per ton. The mean of this is approximately \$50.00. At that rate Chicago's manufactures in 1917 amounted to approximately 50,000,000 tons and its wholesale trade 60,000,000. Undoubtedly some of these items are counted twice, but it is fair to assume that the total commerce of the city in 1919 exceeded 80,000,000 tons.

Although not nearly all of this commerce is north and south bound, the trade seeking that route is increasing rapidly. The opening of the Panama Canal gave a great advantage to the Central West in securing an outlet for South American and Oriental trade. In the fiscal year ending June, 1915, the port of New York handled seventy-two percent of the foreign commerce of the Atlantic coast. It has been recognized for a long time that the port is congested and cannot economically handle such a volume of trade. The present condition emphasizes the importance of another outlet for this trade. The best all water route is down the Mississippi Valley from Chicago and St. Paul to New Orleans and other Gulf Ports.

In the trade with Central and South American countries in the decade just preceding the Great War, New Orleans with Honduras had increased eighty-eight percent;

With Mexico	200 percent		
" Cuba	60	"	"
" Argentina	50	"	"
" Brazil	58	"	"
" Chile	389	"	"
" Peru	594	"	"

The value of agricultural machinery exported to South America in 1911 exceeded \$9,000,000 an increase of 100 percent in five years. Chicago



houses shipped from 1500 to 2000 cars of farm implements a year to South America, and would have shipped more if facilities existed for forwarding promptly.

The exports from the United States in the fiscal year ending June 30, 1920, increased over the fiscal year 1912:<sup>1</sup>

With British India	376 percent		
" China	338	"	"
" Dutch East Indies	1,320	"	"
" Japan	1,190	"	"
" Argentina	195	"	"
" Brazil	217	"	"
" Central America	88	"	"
" Chili	174	"	"
" Cuba	475	"	"
" West Indies	415	"	"

A large proportion of this trade should be carried on through the Gulf Ports. Most of the countries named are just beginning to feel their importance as the United States did one hundred year ago, and the possibilities for extending our foreign with them are almost unlimited.

A few examples will be cited to show the amount of commerce in single commodities that may be expected and the vessels required to conduct them when an adequate canal is once completed. Let it be assumed that Chicago is the consuming and distributing point of only five million people. At the average per capita consumption in the United States this requires 210,000 tons of sugar, 30,000 tons of coffee, 40,000 tons of rice, and 20,000 tons of canned goods. Sisal imported into Chicago through New Orleans exceeds 125,000 tons annual-

<sup>1</sup>U. S. Census, 1920.



ly. These are commodities raised in the southern states or imported into them. To transport this tonnage to Chicago it would require seven fleets of five barges each, each barge hauling 750 tons, to transport the sugar; one fleet of five barges to bring the coffee; two fleets to bring the rice and canned goods to this port; and four fleets to bring the sisal.

When normal freight rates are again established on the ocean an immense amount of Pacific coast lumber will reach the Gulf coast for distribution inland. About sixty percent of the total amount of lumber used in Chicago now comes from the Gulf States. This amounts to about 3,000,000 tons and undoubtedly enough will seek water transportation to keep several fleets of boats constantly employed.





## CHAPTER V.

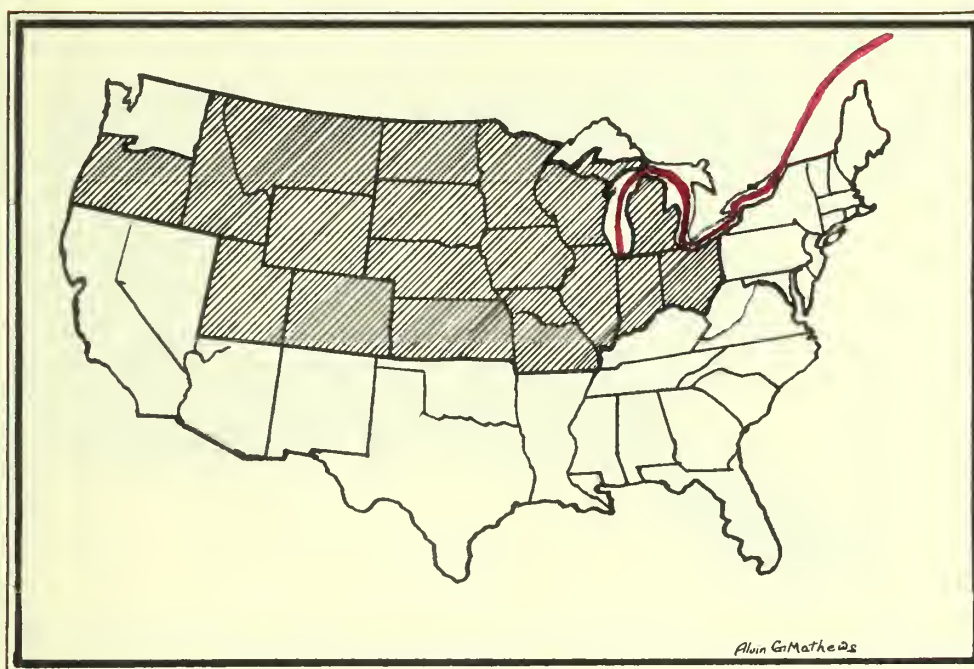
## RELATED PROJECTS AND PENDING ISSUES

## The Great Lakes Seaway

It would be difficult to designate a subject about which the general public is more interested and at the same time more in need of facts and dispassionate expert opinion than the Great Lakes-St. Lawrence Deep Waterway and power development project which Governor Miller of New York characterizes as an "impossible dream" and which Governor Allen of Kansas stoutly champions in behalf of the eighteen middle-west states composing the Great Lakes-St. Lawrence Tidewater Association. (See Plates X and XI, pages 65 and 66).

Upon completion of the Great Lakes Seaway, the Illinois Waterway will become a section of a world transportation system even more extensive in its ramifications than the one which is the immediate prospect. The extent of such a system is graphically illustrated by Plate XII, page 67. It is readily seen from the plate how advantageous is the geographical location of the Illinois Waterway in reference to an ocean steamship route to Chicago as well as barge service on the Mississippi, Ohio, and Missouri Rivers. As far as Illinois is concerned on account of the success of its own waterway development, it really matters little whether the Great Lakes Seaway is built. If nothing is done about it, the Illinois Waterway will carry a great deal of coal and other commodities north to be shipped out by rail and lake, and the barges will return loaded with Chicago manufactures and some of the commodities for which Chicago now acts as a transfer station.



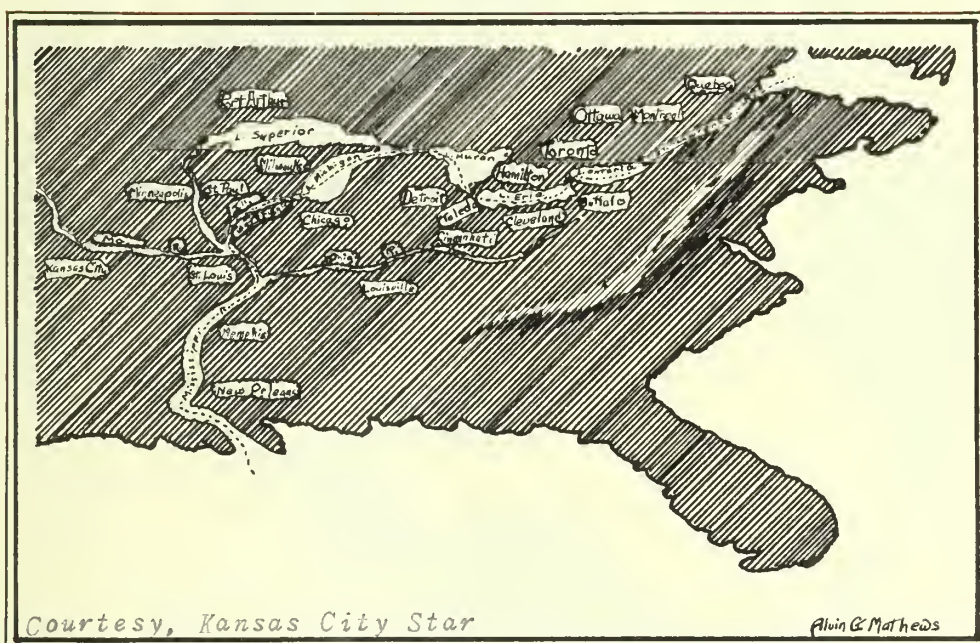
PLATE X.STATES DEMANDING AN OUTLET BY MEANS  
OF THE GREAT LAKES SEAWAY

The eighteen heavily shaded states are urging that the Great Lakes Seaway is a matter of industrial life and death to them.



PLATE XI.

## CITIES TO BECOME SEAPORTS











In event that a deep sea ship-channel should be built down the St. Lawrence to Chicago, the Illinois Waterway would carry more goods to and from Chicago and somewhat fewer barge-loads to and from the southern points. It is probably true, that a Great Lakes Seaway would bring about still lower freight rates and thereby be responsible for more profit to the producer and less cost to the consumer, but it would not affect the total amount of tonnage traversing the Illinois Waterway to any appreciable degree. The territory served by the Illinois Waterway has just so many million tons of goods to dispose of and in like manner the tons of commodities to be brought in from the outside is an inelastic amount which a sea-way to Chicago cannot change. Certain it is that the Great Lakes Seaway may shift somewhat the boundaries of the territory tributary to the Illinois Waterway but the result is bound to approximate the original territory in tonnage. If the little northwest wheat which the Illinois Waterway might have handled is lost to the Great Lakes Seaway, the compensation comes with the increasing status of Chicago as a world port and the Illinois Waterway as her "back-door".

When the effect of the prospective ship channel down the St. Lawrence is viewed from a less localized vantage point, certain very important factors concerning the nation as a whole are brought to light. The opposition of the New York State authorities seems to be based on the belief that the St. Lawrence Canal will be a rival to the New York State barge canal and that it also will be detrimental to the interests of the port of New York. The westerners in favor of the project declare there is traffic enough for both; that not only would the capacity of the barge canal be exceeded if it were possible to divert all the available traffic to the canal, but that the port of New York is so far behind the times that it could not even handle



a fair percentage of what the barge canal itself could carry.

A report submitted to what is known as the International Joint Commission by Colonel Wooten, of the United States Engineer Corps, and W. A. Bowden, of the Canadian Department of Railways and Canals, describes the seaway as follows:<sup>1</sup>

"A project designed to provide channels with a minimum depth of twenty-five feet and sufficient width at all points between Lake Ontario and Montreal, which channels may be subsequently deepened to thirty feet throughout without destroying any permanent construction; to include the incidental development of the first of a series of power projects generating 1,460,000 h.p. net delivered on the switchboard; to permit the subsequent development of the remaining power in the river, which will be neither hindered nor benefited by this improvement for navigation.

"The length of the canal channel is only thirty-three miles and there is strong probability that this will be kept within twenty-four miles when final working plans are developed. Plate XIII, page 70, shows the route of the proposed seaway. The estimated cost of this improvement is \$252,728,200 including the cost of development of 1,460,000 h.p. and its delivery to switchboard.

"The estimated additional cost of obtaining a navigable depth of thirty feet throughout is \$17,936,180, or for a thirty foot project complete, approximately \$270,000,000."

Governor Miller, assailing the project, declares that the tax burden on New York in particular and the country in general would be increased in order to promote an experiment, and that the prime necessity is to improve first our own ports and waterways instead of

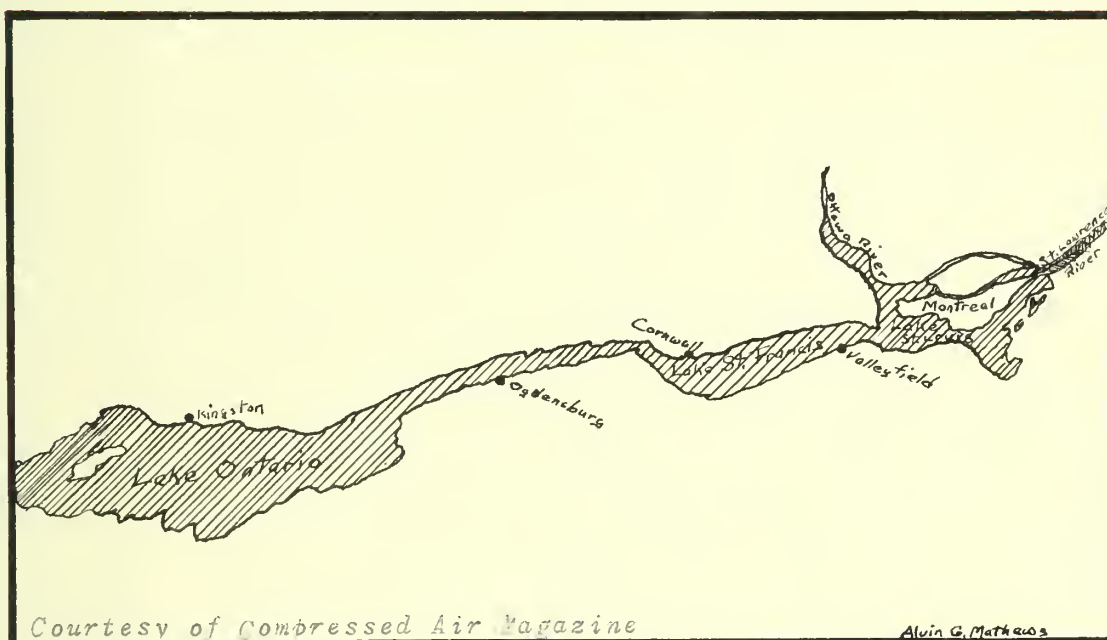
I-----

<sup>1</sup>Current Opinion, February, 1922, page 266.







PLATE XIII.ROUTE OF THE PROPOSED INTERNATIONAL WATERWAY FROM  
LAKE ONTARIO TO THE HEAD OF OCEAN NAVIGATION

It is endorsed by the Governors of eighteen States,  
not including the State of New York.



promoting a project in a foreign country. Over and above the estimated cost of the channel canal, it would be reasonable, in his opinion, to add at least twenty-five percent as unexpected cost, which would bring the United States' half up to more than \$150,000,000 for a canal twenty-five feet deep. He estimates that it would cost the United States an additional \$50,000,000 to dredge the channels of the St. Lawrence and harbors of the Great Lakes to the same depth, so that "we have an initial expense of \$200,000,000 to be borne by the United States" as its half of the project. This is pointed out to be one-fifth of the total amount expended on improving all our rivers and harbors during the entire history of the country. When, echoes the New York Times, the people are crying for relief from excessive Federal taxation, "such a proposal is monstrous".

It also is object that for seven months of the year only, would the route be practicable for navigation at the northern end, and ice and fog would offer obstructions and dangers for a longer period. "The locks and limited channels would shut out the deep-sea ships anyway. Besides, the latter are more expensive to build and operate, haven't the carrying capacity of the lake ships and couldn't compete with them. The oceangoers have to run all the year round to make a living."

As to the feasibility of the canal, Colonel J. G. Warren, Corps of Engineers, United States Army, is quoted, in the Manufacturers Record, as saying that the Great Lakes fleet, composed of the most economical carriers in the world, moves more than 100,000,000 tons of freight each season. These vessels are from 280 to 625 feet in length and have a carrying capacity of from 3,000 to 15,000 short tons.. Most of them can be loaded to a draft of about twenty-two feet.



Colonel Warren states that the United States has spent about \$135,000-000 in improving the harbors, deepening and straightening the channels and building the locks on the St. Mary's and Niagara Rivers. "As a result there is now available a ship channel through and between the upper lakes with a controlling depth of twenty-one feet at mean stage. All the important harbors have corresponding depths. From Lake Erie through the Welland Canal, Lake Ontario and the St. Lawrence River to tidewater at Montreal, the controlling depth is fourteen feet."

Paul T. Brady, an engineer of standing who is identified with important hydro-electric developments in the South and elsewhere, regards the St. Lawrence River development as an undertaking that will be "mightily advantageous to the United States". Even under present conditions, he points out, in the New York Commercial, a large part of the traffic of the central west is seeking an outlet at Montreal. The railroad terminals in and about Montreal had on September 1, 1921, 2,000 cars of Canadian grain in the harbor and the river waiting their chance to be loaded. The elevators were filled with American grain, the Canadian elevator capacity having been secured by American exporters ahead of Canadian shippers. American grain was thus seeking Canadian export in preference to export from New York and other American ports. Emphasis is placed on this fact.

The development of the St. Lawrence, concludes Mr. Brady, and the utilization of its power through the states of New York and New England would be a benefit that can scarcely be calculated. "The barge canal would be taxed to its utmost capacity to take care of the industries that would be purely local to the State of New York, and the railroads of the country would be taxed to their capacity to secure money to develop their lines so that the produce of the country could





be brought to the nearest point of water transportation instead of attempting to haul carloads across the 3,000 miles of the United States."

There are many who feel that if the project were divorced from its aggressive agrarian support in the United States, its popularity would collapse. Likewise, it is pointed out that the waterway is more essential to Canada than it is to the United States and is, therefore, a proper charge upon their resources. This last argument is based on the belief that in exporting wheat, the nation possessing the largest areas of cheap land capable of being tilled with cheap labor enjoys an advantage in foreign markets.

In a bulletin published by The Institute of American Business,<sup>1</sup> the argument is advanced that the present advantages enjoyed by southern ports, especially those on the Gulf, and the whole grain trade built up to prosperous proportions during recent years, are to be swept away if the project goes to completion. The advocates of the St. Lawrence plan are charged with emphasizing the short haul from Duluth and Chicago to Liverpool, while ignoring the various foreign trade routes, just as favorable, now in use. Gulf and South Atlantic ports which during the war were overshadowed by the great export movement to the Allied countries, are now resuming the trade with South America, the Far East, Mexico, and Cuba. The general feeling among a large group of opponents is that all the efforts expended on the improvement of the Mississippi River System would be made futile through canalization of the St. Lawrence, both waterways competing to serve the same territory.

-----  
<sup>1</sup>The Institute of American Business, Bulletin No. 3, March 21, 1922, Fallacies of the St. Lawrence Waterway Scheme.



### "Pittsburgh Plus"

Speaking before the annual convention of the Mississippi Valley Association at Kansas City, April 24, 1922, H. G. Pickering, general counsel for the Western Association of Rolled Steel Consumers had this to say about "Pittsburgh Plus":<sup>1</sup> "Improvement of the waterways, enlargement of the facilities for export trade, and extension of the barge lines, will fail of any material benefit to the Mississippi unless basing point practices which superimpose a phantom freight charge upon the western manufacturer so as to equalize his freights in such a manner as to leave him face to face with eastern competition in any part of the United States, are at the same time eliminated."

"Pittsburgh Plus" is a practice employed by the steel mills of the country whereby they charge as the price for rolled steel products (except rails) the market price at Pittsburgh, plus the freight rate from Pittsburgh to the destination of the steel, no matter what mill it comes from. At Chicago mills there is added to the base price \$7.60 per ton; at Duluth mills, \$13.20, and at Birmingham mills an arbitrary charge of \$5.00 per ton in lieu of the full amount of the freight from Pittsburgh.<sup>2</sup> The effect is to cause many manufacturers of rolled steel products to move their mills to Pittsburgh. The migration is bound to be somewhat disastrous to the Illinois Waterway.

By the means above stated, price competition between the steel mills is eliminated and the high level of price for steel products which has no relation to the cost of production is set. Chicago

<sup>1</sup>Chicago Commerce, April 29, 1922, West is Urged to Act on Vital Issue

<sup>2</sup>Ibid.



is the point of low cost production of steel, and Birmingham next. Notwithstanding this fact steel is sold for a higher price both points than at Pittsburgh.

The practice is a tremendous tax upon the people of the Mississippi Valley and the West. A building requiring 1,000 tons of steel will cost \$7,000 more in Chicago than it will cost in Pittsburgh, although the steel is rolled at a Chicago mill at a lesser cost than it could have been rolled at Pittsburgh. The farmer pays \$6.88 of "plus" in a grain binder; \$1.93 in a corn planter; \$1.89 in a disc harrow; \$3.61 in a horse-drawn gang plow; \$6.28 in a tractor plow; \$3.06 in a grain drill, and \$19.80 in a tractor.<sup>1</sup>

The defense of the practice is upon the theory that there is an excess of demand over the supply of steel everywhere in the United States outside of Pittsburgh, so that Pittsburgh naturally fixes the price in every market. But the facts do not seem to bear this out. Birmingham is more than able to take care of its demands, Duluth exports east, and Chicago has come to be one of the greatest producing centers of steel in the world.

The public has never ceased in its struggle for fair and reasonable prices without discrimination against any buyer or any community. It created the Federal Trade Commission to safeguard its rights in this respect, and has appealed to this body to adjust the unfairness and discrimination in steel prices.

#### Water Pollution on the Illinois Waterway

This is a phase of the general subject which while not vital to the project deserves brief mention. The dumping of Chicago sewage into the Illinois River by means of the Sanitary District Canal is a -----  
Chicago Commerce, April 29, 1922, West is Urged to Act on Vital Issue.





menace to the health of residents in the valley. A certain amount of the sewage is disposed of by carbonization during its course down the river, but the polluted area has gradually extended itself until in 1922 it had gone as far south as Henry, Illinois. Peoria, seeing itself menaced during the course of the next twenty or twenty-five years, has opened an active campaign on the Chicago Sanitary District to speed up the construction of filtration and reduction plants. With their completion this abomination will become past history.<sup>1</sup>

### Flood Control and Reclamation of Bottom Lands

Man is able to derive three distinct economic services from any natural waterway. He may use the stream as a medium of transportation, he may concentrate its natural fall in one spot and by means of a generator obtain power from the energy thus harnessed, or he may reclaim its bottom lands and use the fertile soil thus obtained in growing agricultural products. The third of these has not been considered thus far, but is worthy of some attention because it connects indirectly with the main issue of this discussion through the subject of flood control.

In the spring of 1922, one of the most disastrous floods in the history of Illinois occurred on the Illinois River. Work on the Illinois Waterway was in progress at the time and many people were inclined to feel that throwing dams across the river at its upper end had something to do with the flood. The popular press took hold of the matter and by May, 1922, some little revulsion to the waterway project had been generated. This was short-lived as an investigation brought all the facts to bear against any such contention.

-----  
The great fish industry of Illinois has been materially reduced on account of the contaminated medium. In Peoria, Havana, Beardstown and Lacon, where ten years ago fish were shipped weekly to eastern points by the carload, the industry has now died out.



From the head of the river below Joliet to La Salle the fall of the stream is comparatively rapid, dropping about fifty-three feet. The bluffs are high, the stream is narrow, and the bottom lands are not extensive.

Below La Salle conditions are different. In 233 miles the fall is only thirty-three feet,<sup>1</sup> and for the first eighty miles, only six feet. There the flood plain is much wider, spreading out to seven miles at Beardstown. Nearly 400,000 acres of bottom land are subject to flood between La Salle and Grafton.

Advantage has been taken of these natural condition to construct levees, generally ten to fifteen feet high, following the low water bank, thus permitting farm operations on the wide bottom lands. Plate XIV, page 78, shows the area subject to floods prior to and after the construction of levees. In general, the levees have been located upon the highest ground, without proper regard for the remaining cross-section left for the passage of floods. Therein lies the trouble and cause of the controversy.

The methods of securing flood relief are two:<sup>2</sup> First, flood prevention, in which the actual flow of water is reduced, as through storage of the flood waters, and, second, flood protection, which may best be secured by a more capacious channel for the existing floods. Along the Illinois River no site is available for the hundred thousand acre reservoir which would be needed in case flood prevention were desired. The increased channel capacity can be secured to prevent overflow in time of flood, either by setting the levees farther back or increasing their height. If levee construction could start over again, the levees would better be set farther back from the stream

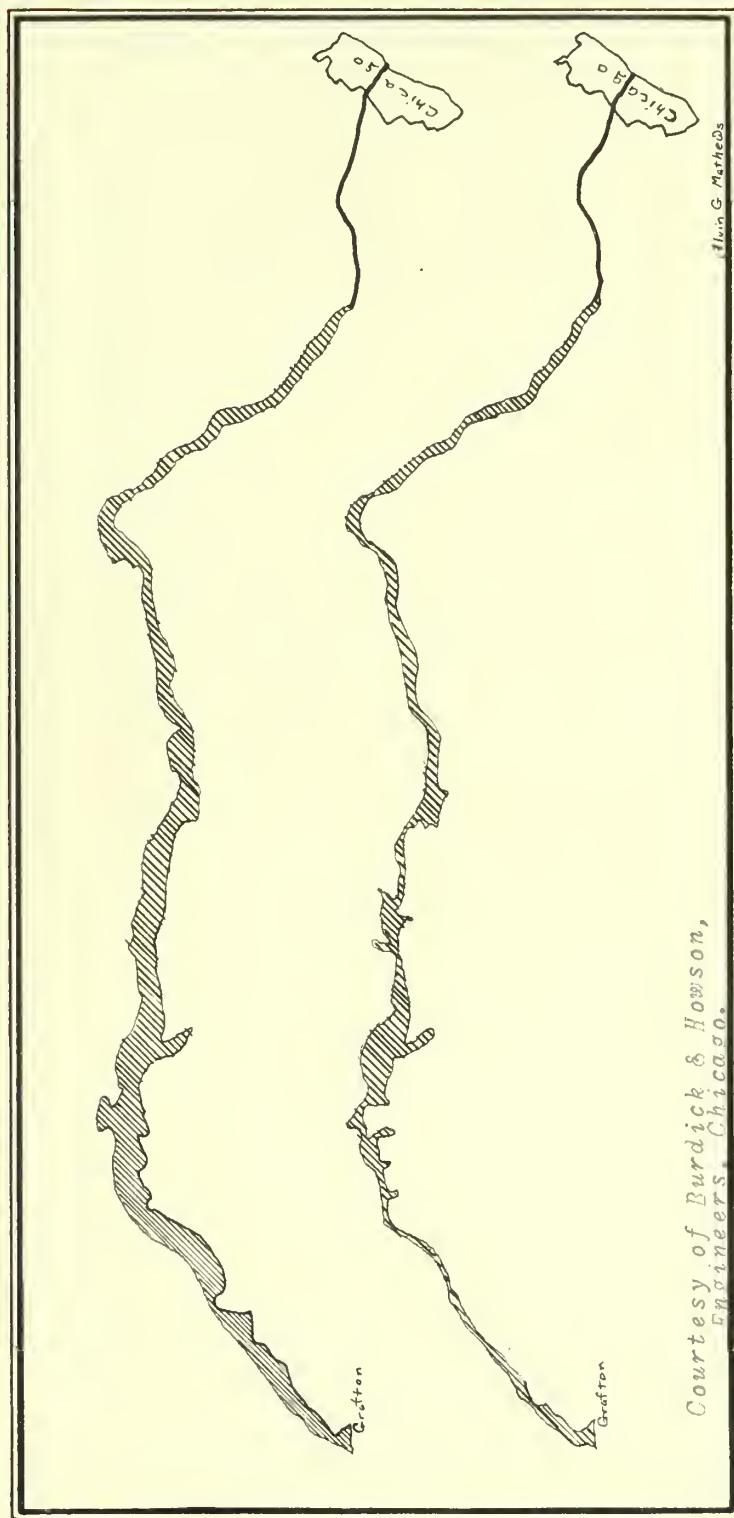
<sup>1</sup>Chicago Commerce, May 13, 1922, Levees Make Trouble on Illinois River.  
Burdick, C. B., Alvord, Burdick and Howson, Engineers, Chicago.

<sup>2</sup>Ibid.



PLATE XIV.

THE FLOOD PRISM ON THE ILLINOIS RIVER BEFORE AND AFTER  
THE CONSTRUCTION OF LEVEES.



The upper graph shows the area subject to floods prior to the construction of levees. The lower graph shows the area available for the passage of floods as it exists since the construction of the levees.





but it is believed that the present investment is too large to accomplish this now. The proper remedy, no doubt, lies in increased height, with due regard to the greatest flood to be expected.



## CHAPTER VI.

## THE RESULTS OF THE SURVEY

Any attempt to forecast accurately the exact number of tons of goods to be hauled on the Illinois Waterway, or say with a certainty just how many dollars and cents will be saved to the people of Illinois on account of this new highway of commerce, would be indeed presumptuous.

From the national standpoint there is no better conclusion than that drawn by President Warren G. Harding, in a speech to the Agricultural Conference held in Washington in January, 1922. Speaking manifestly after consideration of reports of engineers and economists the President stated, in effect, that delay in the matter of inland water transportation had retarded American development, and that delay should therefore end and construction work begin.

"We have too long neglected our waterways," the President said. "We need a practical development of water resources for transportation and power. Waterway improvement represents not only the possibility of expanding our transportation system, but also of producing hydro-electric power for its operation and for the activities of widely diffused industry."

The first sentence quoted might very reasonably have been written after the President had made a personal study of the Illinois Waterway project. Reflection upon the circumstance that a bond issue for this purpose was authorized fifteen years ago, and that practically nothing has been done since, compels the admission that "we have too long neglected" one of the greatest potential resources of the



state and nation.

The real business man is concerned about conservation. Those who do the world's business--whether of production or distribution--are those who of necessity must bear economic waste of mind, body, or material. Therefore whether the business man be a banker, merchant, manufacturer, farmer or hired worker, and wherever he may be located, he is vitally concerned in all waste.

For thirty years or more the State of Illinois has wasted one of the most potential waterways in the world. The wasting of these possibilities of water-borne traffic has made more difficult the solution of the economic problems of this area, the most productive in the United States, and has been responsible in part for the halted progress made in clarifying the problems of the entire nation.

At a comparatively insignificant cost a water channel can be created--with greater carrying capacity than all the railroads in the state. This traffic channel once created is built for all time. The installation of corporate, individual and public carrier service would develop some of the most profitable enterprises in the state. Steel rails rust, locomotives and rolling stock rapidly deteriorate; the Illinois River has been flowing for centuries and its upkeep is practically nothing. Illinois furnished more for the building of the Panama Canal than it will cost to perfect the Illinois Waterway, without receiving a fraction of the benefits from the former which are in the store of the future if the latter is well carried out.

Illinois needs free access to southern, Pacific coast and South American business. The completed channel from Joliet will furnish the necessary freedom of access. It will give water transportation to and from the southern and western states, South America, the





Pacific Coast and Asia; it will enable Illinois to compete with Argentine exports of corn; it will provide cheap transportation for thirty million tons of coal per year to Central and Northern Illinois at a saving of \$15,000,000; it will save the farmers five cents or more per bushel on grain because of reduced freight rates.

In 1921 there were 214 million bushels of corn, oats, wheat, rye, and barley produced within forty miles of the Illinois Waterway. A saving of five cents per bushel on this grain will amount to over nine million dollars. The completed project would also lower the cost of imports from New Orleans on such articles as sugar, coffee, rice and sisal for binding twine; would develop industries along the waterway; and would develop 75,000 electrical horsepower to net the state one and a half million dollars per year. This revenue alone would pay for the canal within a few years. Finally, the course of the Illinois River is such that seventy-eight percent of the area and eighty-six percent of the population of the state will be within trucking distance of the Illinois Waterway and its connecting waters.

There is a fact that remains, however, beyond dispute at the present time and it is this: Our chief reliance for transportation in the United States as a whole will continue to be placed on the railroads for a long time to come. For the good of the nation, the solution of the waterway problem connotes a friendly alliance with the already existing means of transportation. The waterways must assume their place--and it is a minor place--subsidiary to the railroads in the great national scheme of transportation. Our country is no longer laid out for successful waterway supremacy. If these two great groups of transportation facilities are not to be weakened, they must be co-ordinated. That involves a burden for the statesman and the economist. It is one of the first tasks of the future.



## BIBLIOGRAPHY

## BOOKS AND PAMPHLETS.

Barnes, Mortimer G., Inland Waterways and Transportation Costs, Springfield, 1920.

Barnes, Mortimer G., The Illinois Waterway, Springfield, 1921.

Brown, R. G., Improvement of various Navigable Rivers, Government Printing Office, 1913.

Clapp, Edwin J., The Navigable Rhine, Houghton Mifflin, N.Y., 1911.

Delano, F. A., Waterways--Their Limitations and Possibilities. An address before the National Rivers and Harbors Congress of the United States. Washington, 1910.

Deneen, C. S., Deep Waterway. Governor's Message to the Forty-fifth General Assembly of the State of Illinois. At Springfield, 1907.

Deneen, C. S., The Deep Waterway. Governor's Message to the Forty-seventh General Assembly of the State of Illinois. Springfield 1911.

Fairburn, William, Remarks on Canal Navigation. Longman, Rees, Orme, Brown and Green, London, 1831.

Hepburn, A. B., Artificial Waterways of the World. MacMillan, 1914.

Hulbert, A. B., Great American Canals, McClurg, 1904.

Illinois Rivers and Lakes Commission. Annual Reports to date.

Illinois Waterway. An outline of the plan with Editorial Comment from the Press and Resolutions of the State Organizations, 1916.

Leverett, Frank, The Water Resources of Illinois. U.S. Geol. Survey, 17th Annual Report, part 2, pp. 701-849. Map, plate 112.

MacElwee, R. S., and Ritter, A. H., Economic Aspects of the Great Lakes-St. Lawrence Ship Channel. Ronald, 1921.

Memorial of the Iroquois Club of Chicago to the Senate and House of Representatives of the United States. Chicago, 1883.

Memorial Presented by the Trustees of the Sanitary District of Chicago to the Congress of the United States. Deep Waterway from Lake Michigan to the Mississippi River, 1902.

Moulton, Harold Glenn, Waterways versus Railways, Houghton Mifflin, 1912.





Putnam, J. W., An Economic History of the Illinois and Michigan Canal, Journal of Pol. Econ., XVII, 1909. Reprint.

Putnam, J. W., The Illinois and Michigan Canal, University of Chicago Press, 1918.

Report of the Rivers and Lakes Commission on The Illinois River and its Bottom Lands, with Reference to the conservation of Agriculture and Fisheries and the control of Floods. Springfield, 1915.

Shaw, James, The Canal and the Railroads, 1897.

Shelton, W. A., Lakes-to-the-Gulf Deep Waterway, Chicago, 1912.

Stickney, G. W., Project for a navigable waterway from Southern Illinois coal fields to Mississippi River by way of Big Muddy River. Illinois Rivers and Lakes Commission, 1917.

U. S. Cong. Rep. of Examination for canal connecting Lake Superior and the Mississippi River. Government Printing Office, 1909.

U. S. Engineers Department, Final Report, Waterway from Lockport Illinois, to the mouth of the Illinois River. Governemtn Printing Office, 1914.

U. S. Railroad Administration, Division of Waterways, Annual Report, 1918-1919, Division of Inland Waterways. The Administration.

Vernon-Harcourt, Veleson F., A Treatise on Rivers and Canals, Vol. I, Clarendon, Oxford, 1882.





## PERIODICALS

Andrews, F., Inland boat service: Freight rates on farm products and time of transit on inland Waterways in the United States, U.S. Ag. Bull. 74:1-36 '14.

Baker, C. W., What is the future of inland Water Transportation? Engineering N., 84:19-28, 85-9, 137-44, 184-91, 234-42. January 1-29, 1920.

Barnes, M. G., New Illinois Waterway Abstracts. Engineering and Contracting. 53:261-2, March 10, 1920,

Canals and Railways--Discussion, Am. Econ. Ass'n., Bull. 4th Ser. 1:197-203, April, 1911.

Craig, C. P., From the Great Lakes to the Atlantic. Sat. Eve. Post, 192:40-8, June, 1920.

Division of the chief of Engineers, U. S. A., Against the Illinois Waterway. Engineering and Contracting, 45:253-4, March 15, 1916.

Fairlie, J. A., The Economic Effects of Ship Canals., Annals of the Amer. Acad. of Pol. and Social Science, XI, January, 1898.

Final Report of the National Waterways Commission. Review. Am. Econ. R., 2:956-60. December, 1915.

Fisher, W. L., Waterways: their place in our transportation system. J. Pol. Econ. 23:641-62. July, 1915.

Government operation of Inland Waterways. Engineering N. 84:506-7, March 11, 1920.

Hines, W. D., Railroad as Feeders to Waterways. Ry. R. Vol. 64:312-13, March 1, 1919.

Holbrook, E. A., Amorphous Silica of Southern Illinois. Eng. and Min. J., 103:1136-9, June 30, 1917.

Illinois Rivers and Lakes Commission. Bulletins 1-19.

Illinois State Waterway for Barge Navigation. Engineering N. 85:1095-8, December 2, 1920.

Illinois Waterway Proposed Eight Foot Channel from Lockport to Utica. Engineering and Contracting. 43:201. March 3, 1915.

Long, T. K., Lakes -to-the-Gulf Deep Waterway. World Today. 17:1265-8. December, 1909.

McClure, W. F., Chicago-St. Louis Waterway. Sci. Am. 97:209-10. September 21, 1907.

Markham, C. H., Co-Ordination of Rail and Water Transport. Ry. Age, 69:1057-60, December 17, 1920.



Morgan, H. B., Imperative Need of the Lakes to the Gulf Deep Waterway. Munic. Eng. 54:6-7. January, 1918.

Moulton, H. G., Analysis of the Waterways Movement. Ry. R. 58:243-7, February 12, 1916.

Moulton, H. G., Economic Aspects of Inland Water Transportation. J. Geog., 15:73-8, 112-16, November and December, 1916.

Moulton, H. G., Illinois Water-Power Scheme, J. Pol. Econ. 18:381-7, May, 1910.

Moulton, H. G., Setback for the Waterways Movement. J. Pol. Econ. 23:961-70. December, 1915.

Moulton, H. G., Some Aspects of the Waterways Question. J. Pol. Econ. 22:239-52. March, 1914.

Plans to Barge Pig Iron from Southern Illinois Stacks. Iron. Trade R., 61:841, October 18, 1917.

Revive canal Plan to Aid Steel Trade. Iron Trade R. 67:585. August 26, 1920.

Sand, Stone and Gravel supplies adjacent to Cook County, Illinois. Engineering and Contracting. 47:188-91. February 21, 1917.

Skerrett, R. G., Duluth to Liverpool in one bottom. Scientific Am. 122:670. June 19, 1920.

Transportation Cost by Canal and Railway. Cassier's Magazine. 40:761-5. December, 1911.

Ward, E. J., Another plan of the Deep Waterway Problem; A Projected Water Power Waterway from Joliet to Utica, Illinois. World Today. 18:102-5. January, 1910.

Water Transportation For Relieving Railroad Congestion. Coal Age. 13:831-2. March 4, 1918.





## NEWSPAPERS

Chicago Daily News. Files, September 1, 1921 to May 1, 1922.

Chicago Journal of Commerce. Files, Jan. 1, 1921 to May 1, 1922.

Chicago Tribune. Files, June 1, 1921 to May 15, 1922.

## MAPS

Illinois River and its Bottom Lands. Maps. Illinois Rivers and Lakes Commission.

Survey of Waterway from Lake Michigan to Illinois River at La Salle, Illinois. 26 Maps. House of Representatives, Ex. Doc. 264. II.

Vernon-Harcourt, Veleson, F. A Treatise on Rivers and Canals. Vol. II. Clarendon, Oxford, 1882.

Weller, Stuart, The Geological Map of Illinois. Illinois State Geological Survey. Bull. No. 1, University of Illinois, Urbana, 1906.

## BIBLIOGRAPHY

Griffin, A. P. C. Complete List of Works Relating to Deep Waterways from the Great Lakes to the Atlantic Ocean. Government Printing Office. 1908.

Putnam, J. W., The Illinois and Michigan Canal. University of Chicago Press, 1918. Pages 183-203.

References on Provisions of the Cummins Bill Regarding Standards of Rate-Making and Limitation of Profits. Part II--Standards of Rate-Making. Prepared by the Bureau of Railway Economics. 1921.

UNIVERSITY OF ILLINOIS-URBANA



3 0112 108853885